EXHIBIT M:

Claim Chart for Samsung Electronics

DHS; S&T Directorate; "Cell-All" Request: Adding the 1st Ind. claim of the 1st Patent '497 issued to the Complainant (filed 04-05-06), illustrates infringement of Complainant's claimed invention the same as: Ind. claim 1 of the '189 Patent; Ind. claim 22 of the '439 Patent; and, Ind. claim 5 of the '287 Patent. An example of the infringement is demonstrated below in a claim chart using the specifications of Samsung Electronics (i.e. Samsung is representative of the specifications of LG, Apple, and Qualcomm) for the development, manufacture, and commercialization of a Cell-All "WMD Electronic Detection Device". The Synkera "MikroKera Ultra" integration with the Electronic Detection Device is also added.

Samsung: Electronic Detection Device	Patent #: 10,163,287; Independent Claim 5	Patent #: 9,589,439; Independent Claim 22	Patent #: 9,096,189; Independent Claim 1	Patent #: 7,385,497; Independent Claim 1
DHS; S&T "Cell-All" initiative. Develop detection device to detect deadly chemicals". Stephen Dennis; PM: Contracts to Qualcomm, LG, Apple, and Samsung, Sensors will integrate with 261 million electronic devices (i.e. cell phones)	A monitoring device, comprising:	A communication device of at least one of a cell phone, a smart phone, a desktop, a handheld, a personal digital assistant (PDA), a laptop, or a computer terminal, comprising:	A communication device of at least one of a cell phone, a smart phone, a desktop, a handheld, a PDA, a laptop, or a computer terminal for monitoring products, interconnected to a product for communication therebetween, comprising:	A multi sensor detection and lock disabling system for monitoring products and for detecting chemical, biological, and radiological agents and compounds so that terrorist activity can be prevented, comprising:
The performance of Samsung's electronic detection devices: CPU that's a part of the chipset is vital for the daily user experience and the general computing performance of the electronic detection devices (i.e. smartphone).	at least one central processing unit (CPU);	at least one of a central processing unit (CPU), a network processor, or a front end processor for communication between a host computer and other devices;	at least one of a central processing unit (CPU) for executing and carrying out the instructions of a computer program, a network processor which is specifically targeted at the networking application domain, or a front end processor for communication between a host computer and other devices;	a detector case including a front side, a rear side, a power source and a Central Processing Unit (cpu); *Note: Golden's Patents for the Detector Case (i.e. CMDC device; electronic device) ornamental design that antedates Apple's 1st Patent for the Smartphone (i.e. electronic device) ornamental design is illustrated in a chart included in this document*

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Samsung's electronic detection devices has various sensors like the temperature sensor for the battery and the CPU or processor.	at least one temperature sensor in communication with the at least one CPU for monitoring temperature;	X	X	
Samsung's electronic detection devices accelerometers handle axis—based motion sensing—reason why the smartphone can track steps without a separate wearable.	at least one motion sensor in communication with the at least one CPU;	X	X	
Samsung's electronic detection device has set the bar with the highest-rated smartphone displays. With a smartphone panel produced by Samsung, and optimized by Apple	at least one viewing screen for monitoring in communication with the at least one CPU;	X	X	each detector including a sound alarm indicator, a readings panel, a light alarm indicator and a sensor
Samsung's electronic detection device: GPS with A-GPS, GLONASS, BDS, GALILEO	at least one global positioning system (GPS) connection in communication with the at least one CPU;	whereupon a signal sent to the receiver of at least one of… a cell phone detection device… from a satellite or… a cell phone tower or… a GPS connection… causes a signal that includes at least one of location data or sensor data to be sent to the communication device…	at least one satellite connection, Bluetooth connection, WiFi connection, internet connection, radio frequency (RF) connection, cellular connection, broadband connection, long and short range radio frequency (RF) connection, or GPS connection;	an Internet connection, a GPS connection, and a power connection located on the rear side and which are interconnected with the cpu;

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Samsung's electronic detection device: Wi-Fi, dual-band, Wi-Fi Direct, hotspot	at least one of an internet connection or a Wi-Fi connection in communication with the at least one CPU;	wherein at least one of a... WiFi connection, internet connection... capable of signal communication with... the communication device, the receiver of the communication device, or the central processing unit (CPU).		X
Samsung's electronic detection device: cellular connection; Bluetooth	at least one of a Bluetooth connection, a cellular connection, or a satellite connection in communication with the at least one CPU;	at least one of a satellite connection, Bluetooth connection, WiFi connection, internet connection, cellular connection, long and/or short range radio frequency (RF) connection, or GPS connection;	wherein the only type or types of communication with the transmitter and the receiver of the communication device and transceivers of the products is a type or types selected from the group consisting of satellite, Bluetooth, WiFi...	X
Samsung's electronic detection device: After several unsuccessful log-in attempts using a passcode or fingerprint, a Samsung device automatically locks itself up. If unable to log in after the security layers, the only option is to have the device unlocked.	at least one locking mechanism in communication with the at least one CPU for locking the communication device, the at least one locking mechanism configured to at least one of engage (lock) the communication device, disengage (unlock) the communication device, or disable (make unavailable) the communication device;	the communication device being equipped to receive signals from or send signals to engage (lock), disengage (unlock), or disable (make unavailable) locks;	an automatic/mechanical lock disabler interconnected to the cpu and which is mounted to a lock on a product for receiving transmission from the cpu to lock or disable the lock on the product to prevent access to the product by unauthorized, untrained and unequipped individuals; and	

an Internet connection, a GPS connection, and a power connection located on the rear side and which are interconnected with the cpu;		X
at least one power source comprising at least one of a battery, electrical connection, or wireless connection, to provide power to the communication device;	Samsung's electronic detection devices Fast Charge power bank has a capacity of 5,100mAh and can provide up to 1.5 charges for the majority of smartphones. The power bank has an LED power indicator; comes with a micro USB cable and a micro USB to USB Type-C adapter.	X
the communication device being equipped with biometrics that incorporates at least one of a fingerprint recognition or a face recognition to at least one of gain access to the device or to prevent unauthorized use;	wherein the communication device is equipped with a biometric lock disabler that incorporates at least one of a fingerprint recognition, voice recognition, face recognition, hand geometry, retina scan, iris scan and signature such that the communication device that is at least one of the cell phone, the smart phone, the desktop, the handheld, the PDA, the laptop or the computer terminal is locked by the biometric lock disabler to prevent unauthorized use	X
at least one biometric sensor in communication with the at least once CPU for providing biometric authentication to access the communication device;	Samsung's electronic detection devices allows fingerprints to set-up the fingerprint scanner for easy log-in and lock-out. Face unlock uses the front-facing camera to identify the user and unlock the device. Iris scanning uses special sensors on front of phone to identify and unlock the device.	

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Synkera MikroKera Ultra: wireless, wearable, mobile, device detects and identify chemicals in the air using a "sample jet" and sends detection data to another phone or a computer Samsung S3 Classic electronic detection device for chem / bio / human heart rate detection and monitoring at rest or active	at least one sensor for chemical, biological, or human detection in communication with the at least one CPU;	the communication device being at least a fixed, portable or mobile communication device, equipped with at least one wired or wireless sensor for the detection of humans;	the communication device is at least a fixed, portable or mobile communication device interconnected to a fixed, portable or mobile product, capable of wired or wireless communication therebetween…	a plurality of interchangeable detectors for detecting the chemical, biological and radiological agents and compounds and capable of being disposed within the detector case;
Synkera MikroKera Ultra: The device detects and identify chemicals in the air using a "sample jet" and sends detection data to another phone (e.g. Smartphone) or a computer "How does it work?" Shows indicator lights for the monitoring device; relayed over a cellular network to the monitoring center. WMD sensor development for the Cell-All Initiative: Qualcomm, NASA, and Rhevision Technology	one or more detectors in communication with the at least one CPU for detecting at least one of chemical, biological, radiological, or explosive agents;	at least one of a chemical sensor, a biological sensor, an explosive sensor, a human sensor, a contraband sensor, or a radiological sensor; that is wired or wireless, capable of being disposed within, on, upon or adjacent the communication device;	wherein the communication device receives a signal via any of one or more products listed in any of the plurality of product grouping categories;	a plurality of indicator lights located on the front side with each indicator light corresponding to and indicating the detection of one specific chemical, biological and radiological agent and compound;

Samsung's electronic detection device, near-field communication (NFC) Ring can unlock the device. The NFC Ring has two NFC tag inlays inside the ring and can be used to unlock & control mobile devices.	at least one radio-frequency near-field communication (NFC) connection in communication with the at least one CPU...	the communication device being capable of wireless near-field communication (NFC) which allows radio frequency (RF) data to be at least one of received or transferred between the communication device and at least one tag that is read by the communication device;	X	X
The Samsung SmartThings contains: one Samsung SmartThings Hub, two Samsung SmartThings Multipurpose Sensors, one Samsung SmartThings Motion Sensor, and one Samsung SmartThings Outlet. Connects to appliances, lights, locks, cameras, thermostats, sensors. Get alerts on smartphone if motion in the home. BMW Digital Key to lock/unlock; and start it up with Samsung phones only *Synkera MikroKera Ultra:* The device detects and identify chemicals in the air using a "sample jet" sends detection data to another phone	at least one of a transmitter or a transceiver in communication with the at least one CPU configured to send signals to monitor at least one of a door, a vehicle, or a building, send signals to lock or unlock doors, send signals to control components of a vehicle, send signals to control components of a building, or... detect at least one of a chemical biological, radiological, or explosive agent such that the communication device is capable of communicating, monitoring, detecting, and controlling.	a transmitter for transmitting signals and messages to at least one of a multi-sensor detection device, a cell phone detection device, or a locking device; a receiver for receiving signals, data or messages from at least one of a multi-sensor detection device, a cell phone detection device, or a locking device;	a transmitter for transmitting signals and messages to at least one of plurality product groups based on the categories of a multi-sensor detection device, a maritime cargo container, a cell phone detection device, or a locking device; a receiver for receiving signals, data or messages from at least one of plurality product groups based on the categories of a multi-sensor detection device, a maritime cargo container, a cell phone detection device, or a locking device;	whereupon detection of specific chemical, biological, or radiological agents or compounds by the detectors causes the lighting of the corresponding indicator light for visual confirmation of the detection and initiates signal transmission from the cpu to the automatic/mechanical lock disabler to lock or disable the lock of the product thereby preventing further contamination about the product and denying access to the product by unauthorized, untrained and unequipped individuals.

The Samsung SmartThings Home Monitoring Kit contains: one Samsung SmartThings Hub, two Samsung SmartThings Multipurpose Sensors, one Samsung SmartThings Motion Sensor, and one Samsung SmartThings Outlet. Connects to appliances, lights, speakers, locks, cameras, thermostats, sensors. Get alerts on smartphone if there's unexpected entry or motion in the home.	X	X	whereupon the communication device, is interconnected to a product equipped to receive signals from or send signals to lock or unlock doors, activate or deactivate security systems, activate or deactivate multi-sensor detection systems, or to activate or deactivate cell phone detection systems;
Samsung electronic detection devices (i.e. at least the Galaxy Note 8 & Galaxy S8 smartphones, and Samsung Gear S3 Classic	X	X	wherein at least one satellite connection, Bluetooth connection, WiFi connection, internet connection, radio frequency (RF) connection, cellular connection, broadband connection, long and short range radio frequency (RF) connection is capable of signal communication with the transmitter and the receiver of the communication device and transceivers of the products;

TECHNICAL and DOMESTIC CLAIM CHARTS

Enclosures:

TECHNICAL CLAIM CHART for SAMSUNG GALAXY NOTE 8

TECHNICAL CLAIM CHART for SAMSUNG GALAXY S8

DOMESTIC CLAIM CHART for SAMSUNG

HISTORY - 2007

Submitted by Complainant: Larry Golden

SAMSUNG GALAXY NOTE 8

Technical Rational

COMPLAINANT'S DEVICE: CMDC

INTERCONNECTION CAPABILITIES

RESPONDENT'S MOBILE DEVICE: SAMSUNG GALAXY NOTE 8

Samsung Galaxy Note 8 (mobile device industry) interconnected to: "Samsung SmartThings Hub" (home security industry); Samsung Gear S3 (electronic device industry); "Volkswagen Car-Net e-Remote" (locking device)	Patent #: 9,589,439; Independent Claim 22	Patent #: RE 43,990; Dependent Claims
The Samsung Galaxy Note 8 communication, monitoring, detecting, controlling (CMDC) device. The SmartThings app turns the Samsung Galaxy Note 8 smartphone into a remote to control all of the smart devices in your home. Available for download for Android, iOS and Windows. The Samsung SmartThings Hub communicates information from your smartphone to all of your different connected products–regardless of their wireless protocol–so that you can easily monitor and control them from the free SmartThings app. Samsung created new version of Volkswagen app which gives control over key features of your car directly from the smartwatch – Samsung Gear S3 Classic. The Gear S3, will need to be connected to a mobile device (e.g. Galaxy Note 8). Samsung's partnership with Volkswagen, for smartphone connections via Car Mode for Galaxy, an app powered by MirrorLink. Car Mode for Galaxy. Volkswagen Car-Net e-Remote, if own a VW and Gear S3, enables check that car is locked with smartwatch.	A communication device of at least one of a cell phone, a smart phone, a desktop, a handheld, a personal digital assistant (PDA), a laptop, or a computer terminal, comprising:	18. The communication device of claim 11 wherein the communication device having a basic monitoring terminal can be adapted and incorporated to include desktop computers, notebook, PC's, laptops, cell phones, smart phones, LCD monitors, and satellite monitoring

118. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.	The Gear S3 Classic need to connect to a mobile device (e.g. Galaxy Note 8) using the Samsung Gear application. The application must be installed on the mobile device (e.g. Galaxy Note 8). The Gear S3 Classic sensors include: Accelerometer; Gyroscope; Heart Rate; and, Barometer. Connectivity include: 802.11 b/g/n WiFi; Bluetooth 4.2 A2DPO, LE; and near-field communication (NFC). GPS include: a GPS receiver and two apps, Nike+ and S Health, that include GPS tracking support; and Glonass (satellite). Platform: operating system (OS) Tizen-based wearable platform 2.3.2.; chipset Exynos 7270; Central processing unit (CPU) dual-core 1.0 Ghz
at least one of a chemical sensor, a biological sensor, an explosive sensor, a human sensor, a contraband sensor, or a radiological sensor; that is wired or wireless, capable of being disposed within, on, upon or adjacent the communication device;	
12. The communication device [of claim 11] wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).	Samsung Galaxy Note 8 CPU (Central Processing Unit) Octa-core (4x2.35 Ghz Kryo & 4x1.9 Ghz Kryo- USA & China - otherwise known as a processor - is an electronic circuit that can execute computer programs. The Samsung Galaxy Note 8 smartphones and tables don't just use "processors", they use what's called a System-on-a-chip (SoC). The SoC is the equivalent of a computer motherboard, including main processor, graphics processor and memory, on a single chip. The CPU is nonetheless a must-have component of the SoC. Modern SoCs have two, and soon four, processors cores ("multi-core"). Chipset: Qualcomn MSM8998 Snapdragon 835 - USA & China
at least one of a central processing unit (CPU), a network processor, or a front end processor for communication between a host computer and other devices;	

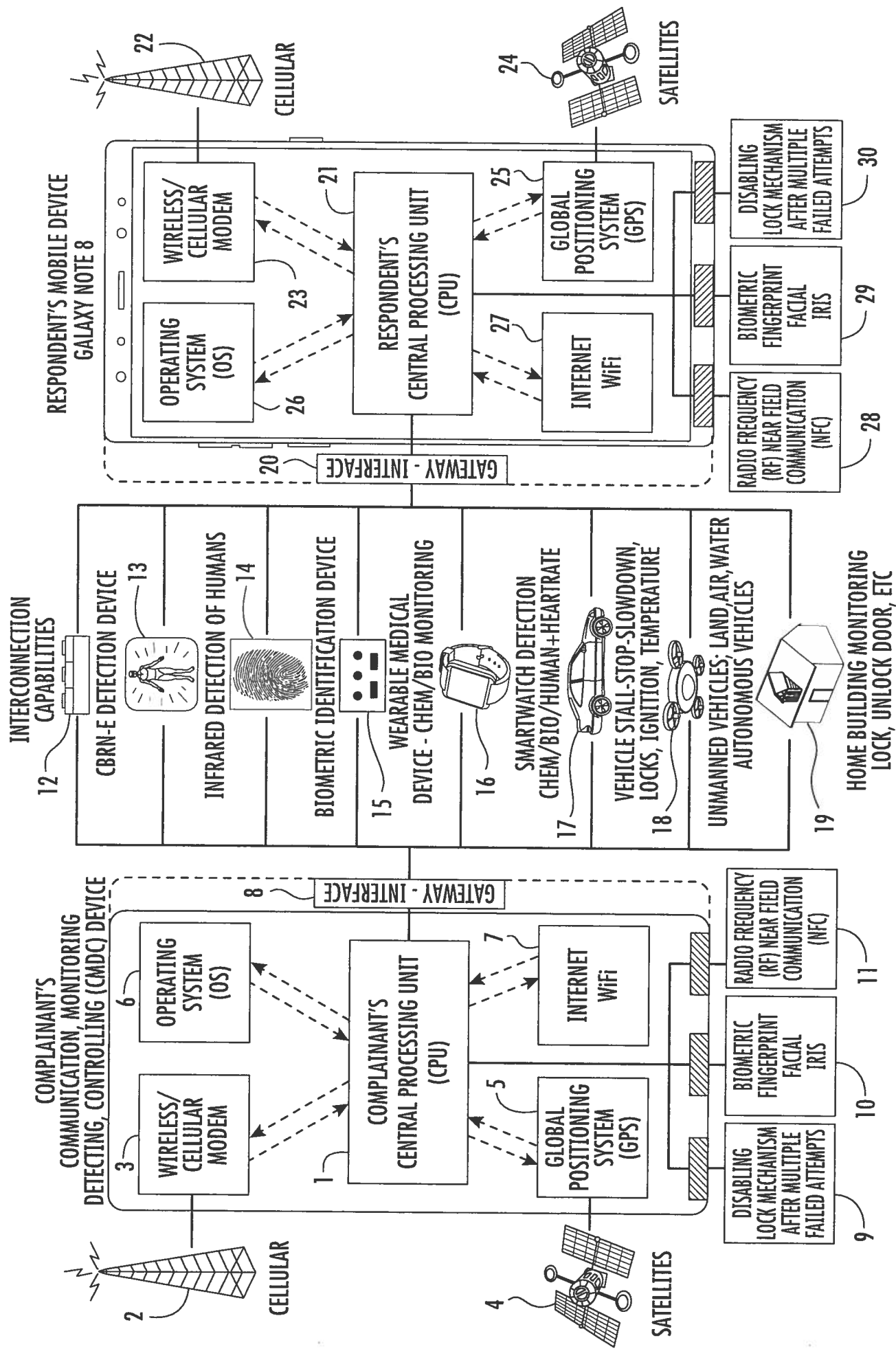|		
28. The communication device [of claim 11] wherein the communication device can send and receive signals, send and receive warnings, send and receive commands, send and receive data, information and report the status of the sensors and operational equipment systems to and from a cell phone, smart phone, PDA or handheld device.	a transmitter for transmitting signals and messages to at least one of a multi-sensor detection device, a cell phone detection device, or a locking device;	The Samsung Galaxy Note 8 capable of automatically transmitting a signal to lock after several failed log-in attempts. The Samsung Galaxy Note 8 "Fingertip Heart Rate Monitor" detection device (e.g. cell phone detection device) is a built-in monitor that measures heart rate from a fingertip using a biosensor.
28. The communication device [of claim 11] wherein the communication device can send and receive signals, send and receive warnings, send and receive commands, send and receive data, information and report the status of the sensors and operational equipment systems to and from a cell phone, smart phone, PDA or handheld device.	a receiver for receiving signals, data or messages from at least one of a multi-sensor detection device, a cell phone detection device, or a locking device;	The Samsung Galaxy Note 8 capable of receiving a signal to reset (e.g. unlock; locking device) the phone. The Samsung Galaxy Note 8 "Fingertip Heart Rate Monitor" detection device (e.g. cell phone detection device) is a built-in monitor that measures heart rate from a fingertip using a biosensor.
25. The communication device [of claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.	at least one of a satellite connection, Bluetooth connection, WiFi connection, internet connection, cellular connection, long and/or short range radio frequency (RF) connection, or GPS connection;	Cellular data connection: The connection that the Galaxy Note 8 uses to exchange data over the air using your mobile operator's cellular network. Cellular network connection: the Galaxy Note 8 uses for voice and data connect. This network is managed by the mobile operator. WLAN: Wi-Fi 802.11 a/b/g/n/ac, dual-band, Wi-Fi Direct, hotspot. Bluetooth: 5.0, A2DP, EDR, LE. GPS, A-GPS, Glonass (satellite), BDS, Galileo (satellite)

30. The communication device [of claim 11] wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition, voice recognition, face recognition, hand geometry, retina scan, iris scan, heart rate, pulse or signature, thereby allowing access to the product by authorized, trained, and equipped individuals and preventing access to the product by unauthorized, untrained, and unequipped individuals.	22. The communication device [of claim 11] wherein the communication device is designed to be equipped with applications for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, using a smart phone, cell phone, PDA, laptop or desktop
the communication device being at least a fixed, portable or mobile communication device, equipped with at least one wired or wireless sensor for the detection of humans;	the communication device being equipped to receive signals from or send signals to engage (lock), disengage (unlock), or disable (make unavailable) locks;
Seven wireless interfaces in the Samsung Galaxy Note 8 smartphone - Frequency Division Duplex Cellular, Time Division Duplex Cellular, Wi-Fi, Bluetooth, GNSS (Global Navigation Satellite System), Near-Field Communication, and Wireless Charging. Samsung allows 4 fingerprints to set-up the fingerprint scanner; for log-in and lock-out. Samsung's Face unlock uses the front-facing camera to identify the user and unlock the device. Samsung's iris scanning method, uses special sensors on front of phone to identify and unlock the device.	After several unsuccessful log-in attempts using a passcode or fingerprint, a Samsung device automatically locks itself up as a security feature. If user is unable to log in after doing all the security layers, there's no other option but to have the phone unlocked. Samsung's near-field communication (NFC) enabled smartphone: slide hand on the back and the NFC Ring can unlock it. The NFC Ring comes with two special NFC tag inlays inside the ring. The NFC Ring can be used to unlock & control mobile devices

30. The communication device [of claim 11] wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition, voice recognition, face recognition, hand geometry, retina scan, iris scan, heart rate, pulse or signature, thereby allowing access to the product by authorized, trained, and equipped individuals and preventing access to the product by unauthorized, untrained, and unequipped individuals.	the communication device being equipped with biometrics that incorporates at least one of a fingerprint recognition or a face recognition to at least one of gain access to the device or to prevent unauthorized use;	Samsung only allows you to register 4 fingerprints to set-up the fingerprint scanner; a security feature for easy log-in and lock-out. Samsung's new Face unlock feature uses the front-facing camera to identify the user and unlock the device. Samsung has included an iris scanning method, which uses special sensors on the front of the phone to identify you and unlock the device. Iris scanning is considered one of the most secure biometric methods
20. The communication device [of claim 11] wherein the communication device can be interconnected through wire or wireless for communication, signals, commands and transmission of data.	the communication device being capable of wireless near-field communication (NFC) which allows radio frequency (RF) data to be at least one of received or transferred between the communication device and at least one tag that is read by the communication device;	Seven wireless interfaces now found in the Samsung Galaxy Note 8 high-end smartphone - Frequency Division Duplex Cellular, Time Division Duplex Cellular, Wi-Fi, Bluetooth, GNSS (Global Navigation Satellite System), Near-Field Communication, and Wireless Charging
25. The communication device [of claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.	whereupon a signal sent to the receiver of at least one of a multi-sensor detection device, a cell phone detection device, or a locking device from a satellite or a cell phone tower or through at least one of a Bluetooth connection, a WiFi connection, an internet connection, a cellular connection, a GPS connection, a short range radio frequency (RF) connection, or a long range radio frequency (RF) connection, causes a signal that includes at least one of location data or sensor data to be sent to the communication device; and	Cellular data connection: The connection that the Galaxy Note 8 uses to exchange data over the air using your mobile operator's cellular network. Cellular network connection: The network that the Galaxy Note 8 uses for making voice and data connections. This network is managed by the mobile operator. WLAN: Wi-Fi 802.11, Wi-Fi Direct, hotspot. Bluetooth: 5.0, A2DP, LE, EDR. The Galaxy can determine location using its built-in Global Positioning System (GPS) transmitter, Wi-Fi networks, and mobile networks.

The Samsung Galaxy Note 8 capable of automatically transmitting a signal to lock after several failed log-in attempts. The Samsung Galaxy Note 8 capable of receiving a signal to reset (e.g. unlock; locking device). Thereby activating or deactivating a security system. **Chipset: Qualcomm MSM8998 Snapdragon 835 - USA & China**	wherein at least one of a satellite connection, Bluetooth connection, WiFi connection, internet connection, cellular connection, long range radio frequency (RF) connection, or short range radio frequency (RF) connection, capable of signal communication with the transmitter of the communication device, the receiver of the communication device, or the central processing unit (CPU).
	28. The communication device [of claim 11] wherein the communication device can send and receive signals, send and receive warnings, send and receive commands, send and receive data, information and report the status of the sensors and operational equipment systems to and from a cell phone, smart phone, PDA or handheld device.

1. Complainant's Central Processing Unit (CPU): [Patent RE43,990]; Claim 16. The communication device of claim 11 wherein the communication device can be adapted or incorporated with cell phone towers and satellites for use with satellite communication and/or a cell tower, wi-fi, wi-max, broadband, GPS, navigation, radio frequency (RF) chips, radio frequency (RF) sensors, radio frequency (RF) transceivers, and radio frequencies for short and long range transmissions interconnected to the central processing unit (cpu).

2. Cellular: [Patent RE43,990]; Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

3. Wireless/Cellular Modem: [Patent RE43,990]; Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

4. Satellites: [Patent RE43,990]; Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

5. Global Positioning System (GPS): [Patent RE43,990]; Claim12. The communication device of claim 11 wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).

6. Operating System (OS): [Patent RE43,990] Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

7. Internet WiFi: [Patent RE43,990]; Claim 12. The communication device of claim 11 wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).

8. Gateway – Interface: [Patent RE43,990]; Claim 32. The communication device of claim 11 wherein the communication device having products to be monitored, the devices that are monitoring, communication devices, communication equipment can be grouped into anti-terrorist product groupings based on the categories of similarities of design of at least one of; sensors, software, interfaces, detector cases, locks, mobile communication devices, handheld communication devices, vehicle slowing and stopping devices.

9. Disabling Lock Mechanism after Multiple Failed Attempts: [Patent RE43,990]; Claim 22. The communication device of claim 11 wherein the communication device is designed to be equipped with applications for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, using a smart phone, cell phone, PDA, laptop or desktop.

10. Biometric Fingerprint Facial Iris: [Patent RE43,990]; Claim 30. The communication device of claim 11 wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition...

11. Radio Frequency (RF) Near Field Communication (NFC): [Patent RE43,990]; Claim 23. The communication device of claim 11 wherein the communication device is designed to be equipped with a radio frequency (RF) chip for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, capable of a two-way, bi-directional radio frequency (RF) communication link that makes the communication device work as a radio frequency (RF) sensor or a radio frequency (RF) transceiver.

12. CBRN-E Detection Device: [Patent RE43,990]; Claim 26. The communication device of claim 11 wherein the communication device has a plurality of sensors for detecting the chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which is capable of being disposed within each communication device.

13. Infrared Detection of Humans: [Patent RE43,990]; Claim 31. The communication device of claim 11 wherein the communication device is designed to be used as a standalone detection system for the detection of bombs that have been surgically implanted by using at least one of the human vitals sensors of; a heart sensor, a nerve sensor, a perspiration sensor, an inflammation sensor, a pulse sensor, a blood pressure sensor, a temperature sensor, a breath sensor, or a radiation sensor.

14. Biometric Identification Device: [Patent RE43,990]; Claim 30. The communication device of claim 11 wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition...

15. Wearable Medical Device – Chem/Bio Monitoring: [Patent RE43,990]; Claim 97. The multi-sensor detection system of claim 81, wherein the multi sensor detection device is capable of being embedded into; placed in, on, or adjacent to a product or area targeted for monitoring.

16. Smartwatch Detection Chem/Bio/Human/Heartrate: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

17. Vehicle Stall-Stop-Slowdown, Locks, Ignition, Temperature: [Patent RE43,990]; Claim 15. The communication device of claim 11 wherein the communication device capable of sending signals to the vehicle's operating equipment systems of at least one of, but not limited to, an ignition

for starting and stopping, a lock for unlocking and locking, a horn for sounding; capable of receiving data and diagnostic information of the vehicle's operating equipment systems.

18. Unmanned Vehicles; Land, Air, Water Autonomous Vehicles: [Patent RE43,990]; Claim 15. The communication device of claim 11 wherein the communication device capable of sending signals to the vehicle's operating equipment systems of at least one of, but not limited to, an ignition for starting and stopping, a lock for unlocking and locking, a horn for sounding; capable of receiving data and diagnostic information of the vehicle's operating equipment systems.

19. Home Building Monitoring Lock, Unlock Door, Etc.: [Patent RE43,990]; Claim 22. The communication device of claim 11 wherein the communication device is designed to be equipped with applications for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, using a smart phone, cell phone, PDA, laptop or desktop.

20. Gateway – Interface: With the smartwatch, the smartphone is the gateway. Using smartphones as our gateway to the Internet of Things we can add more context into activities. A complete Internet of Things (IoT) system integrates four distinct components: sensors/devices, connectivity, data processing, and a user interface. The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet.

21. Respondent's Central Processing Unit (CPU): This is the "brain" of the smartphone. The central processing unit (CPU) receives commands, makes instant calculations, and sends signals throughout the device. How the parts of the processor work together: The CPU connectivity features (GPS, WiFi), and 3G/4G modem are the major components of a mobile processor that control the operation of some of the most powerful and power-efficient smartphones.

22. Cellular: A smartphone is essentially a two-way radio, consisting of a radio transmitter and a radio receiver. When you chat with your friend on your smartphone, your phone converts your voice into an electrical signal, which is then transmitted via radio waves to the nearest cellular tower. The network of cell towers then relays the radio wave to your friend's smartphone, which converts it to an electrical signal and then back to sound again. In the basic form, a smartphone works just like a walkie-talkie.

23. Wireless/Cellular Modem: These components control your connection to the world. Broadly speaking, the RF Transceiver receives and transmits voice connections and the modem enables your phone to send and receive digital signals. When enabled with 4G LTE, the radio and modem have a high-speed cellular wireless network at their disposal, capable of speeds that mimic your home Wi-Fi connection. When working closely with the CPU and GPU, a 4G LTE modem can deliver seamless, fluid access from your LTE network to your applications.

24. Satellites: There are 24 satellites (with an additional three orbiting on standby - just in case), although your smartphone's GPS only needs to receive signals from a fraction of them at any one time, with three satellites your smartphone can calculate a 2D position and track your movement. Four or more satellites enables a 3D position, adding altitude to latitude and longitude, and allowing for more effective tracking.

25. Global Positioning System (GPS): Your smartphone's GPS receiver analyzes high-frequency radio waves sent out from each satellite, with synchronized clocks in both the receiver and satellite recording the time that signals are transmitted, with the GPS chip timing exactly how long it takes to get from the satellite to your mobile phone – and it knows the speed of the signal, so with both those pieces of information, it can work out the distance from the satellite. As long as your mobile device is receiving signal from three or more satellites, it's possible to work out where you are, by calculating how far you are from each satellite.

26. Operating System (OS): Mobile operating systems combine features of a personal computer operating system with other features useful for mobile or handheld use; usually including, and most of the following considered essential in modern mobile systems; a cellular, Bluetooth, Wi-Fi, Global Positioning System (GPS) mobile navigation, speech recognition, near field communication (NFC)

27. Internet WiFi: Connected devices also generate massive amounts of Internet traffic, including loads of data that can be used to make the devices useful. The Internet of Things (IoT), also sometimes referred to as the Internet of Everything (IoE), consists of all the web-enabled devices that collect, send and act on data they acquire from their surrounding environments using embedded sensors, processors and communication hardware. These devices, often called "connected" or "smart" devices, can sometimes talk to other related devices, a process called machine-to-machine (M2M) communication. The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet.

28. Radio Frequency (RF) Near Field Communication (NFC): NFC is a method of wireless data transfer that detects and then enables technology in close proximity to communicate without the need for an internet connection. The tech involved is deceptively simple: an NFC chip operates as one part of a wireless link. Once it's activated by another chip, small amounts of data between the two devices can be transferred when held a few centimeters from each other.

29. Biometric Fingerprint, Facial, and Iris: Previously seen mostly in military devices and fixed installations, iris scanning is joining other biometric authentication methods (such as fingerprint scanning, facial recognition and voice recognition) intended to move mobile devices beyond the limitations of password-based security.

30. Disabling Lock Mechanism after Multiple Failed Attempts: If you or someone else enters the wrong passcode too many times, your device will disable itself temporarily. The device can be remotely wiped after the specified number of failed password attempts.

Technical Rational

COMPLAINANT'S DEVICE: CMDC

CBRNE-H DETECTION DEVICE

RESPONDENT'S MOBILE DEVICE: SAMSUNG GALAXY NOTE 8

"Biotouch" Samsung Galaxy Note 8. (Government Industry: Military; Law Enforcement; First Responders; other Gov't Employees)	Patent #: 9,589,439; Independent Claim 13	Patent #: RE 43,990; Dependent Claims
Partnership: U.S. Army Edgewood Chemical Biological Center (ECBC), iSense, LLC., U.S. Army Communications-Electronics Research, Development and Engineering Center (CERDEC) and the Defense Threat Reduction Agency (DTRA). ECBC, iSense, CERDEC and DTRA are working on way to evaluate potential chemical/biological (CB) threats using smartphones. Two smartphones: the Biotouch that test the VOC and the Nett Warrior phone. VOCs are postage stamp-sized, colorimetric sensor assays with 88 different indicator dyes developed by iSense.	A communication device of at least one of a cell phone, a smart phone, a desktop, a handheld, a personal digital assistant (PDA), a laptop, or a computer terminal for monitoring products, interconnected to a product for communication therebetween, comprising:	18. The communication device [of claim 11] wherein the communication device having a basic monitoring terminal can be adapted and incorporated to include desktop computers, notebook, PC's, laptops, cell phones, smart phones, LCD monitors, and satellite monitoring.
MIT: A Samsung Galaxy smartphone-based sensing strategy can use chemiresponsive nanomaterials integrated into the circuitry of near-field communication tags to achieve portable detection and discrimination of gas phase chemicals (e.g., ammonia, hydrogen peroxide, cyclohexanone, and water). The galaxy's smartphone heart rate monitor is known as a Biosensor – Pulse/Oxy IC. The heart rate monitor shines a red/infrared light through the finger and measures the pulse as the heart beats. The fingerprint scanner: a touch sensor incorporated into the home button.	at least one of a chemical sensor, a biological sensor, an explosive sensor, a human sensor, a contraband sensor, or a radiological sensor; that is wired or wireless, capable of being disposed within, on, upon or adjacent the communication device;	118. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

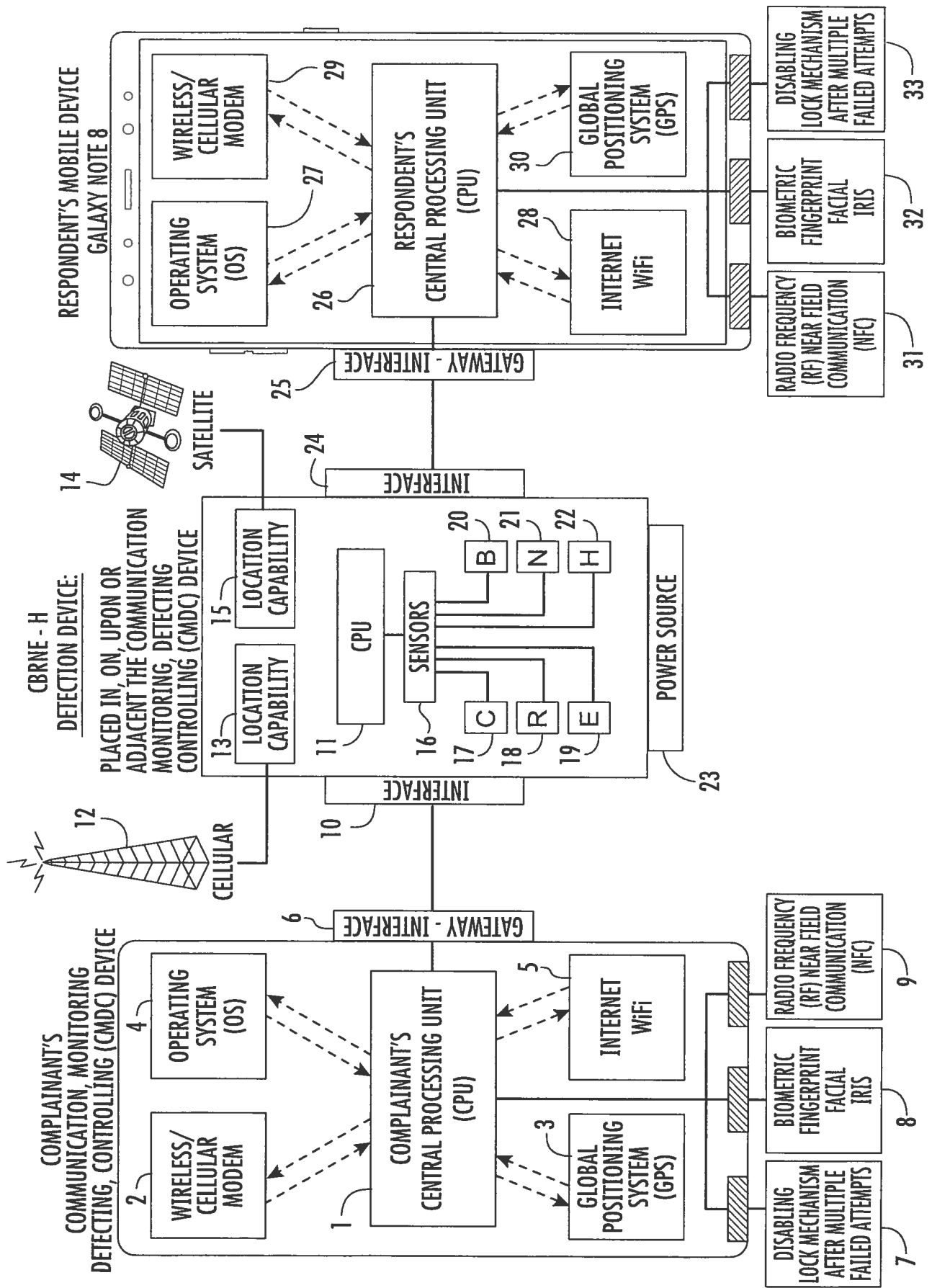|		
12. The communication device [of claim 11] wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).	28. The communication device [of claim 11] wherein the communication device can send and receive signals, send and receive warnings, send and receive commands, send and receive data, information and report the status of the sensors and operational equipment systems to and from a cell phone, smart phone, PDA or handheld device.	28. The communication device [of claim 11] wherein the communication device can send and receive signals, send and receive warnings, send and receive commands, send and receive data, information and report the status of the sensors and operational equipment systems to and from a cell phone, smart phone, PDA or handheld device.
at least one of a central processing unit (CPU) for executing and carrying out the instructions of a computer program, a network processor which is specifically targeted at the networking application domain, or a front end processor for communication between a host computer and other devices;	a transmitter for transmitting signals and messages to at least one of a multi-sensor detection device, a maritime cargo container, a cell phone detection device, or a locking device;	a receiver for receiving signals, data or messages from at least one of the multi-sensor detection device, the maritime cargo container, the cell phone detection device, or the locking device;
Samsung Galaxy Note 8 CPU (Central Processing Unit) - otherwise known as a processor - is an electronic circuit that can execute computer programs. Modern microprocessors appear in everything from automobiles to mobile phones. Octa-core (4x2.35 GHz Kryo & 4x1.9 GHz Kryo) - USA & China. **The wireless and cellular is Qualcomm's MSM8998 Snapdragon 835 - USA & China.**	The Samsung Galaxy Note 8 capable of automatically transmitting a signal to lock after several failed log-in attempts. Indicator icons: Shows the information needed to operate the device, such as the received or transmitted signal strength, device battery level, time, unread Emails, missed calls, etc. Infrared Blaster: Emits infrared signals used for controlling external devices.	The Samsung Galaxy Note 8 capable of receiving a signal from the factory to reset (unlock) the phone. Indicator icons: Shows the information needed to operate the device, such as the received or transmitted signal strength, device battery level, time, unread Emails, missed calls, etc. Infrared Blaster: Emits infrared signals used for controlling external devices.

25. The communication device [of claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.	20. The communication device [of claim 11] wherein the communication device can be interconnected through wire or wireless for communication, signals, commands and transmission of data.	28. The communication device [of claim 11] wherein the communication device can send and receive signals, send and receive warnings, send and receive commands, send and receive data, information and report the status of the sensors and operational equipment systems to and from a cell phone, smart phone, PDA or handheld device.
at least one of a satellite connection, Bluetooth connection, WiFi connection, internet connection, radio frequency (RF) connection, cellular connection, broadband connection, long range radio frequency (RF) connection, short range radio frequency (RF) connection, or GPS connection;	the communication device is at least a fixed, portable or mobile communication device interconnected to a fixed, portable or mobile product, capable of wired or wireless communication therebetween; and	whereupon the communication device, is interconnected to a product equipped to receive signals from or send signals to lock or unlock locking devices, activate or deactivate security systems, activate or deactivate multi-sensor detection systems, or to activate or deactivate cell phone detection systems;
The Samsung Galaxy Note 8 can determine location using its built-in Global Positioning System (GPS) transmitter, Wi-Fi networks, and mobile networks. WLAN: Wi-Fi 802.11 a/b/g/n/ac, dual-band, Wi-Fi Direct, hotspot. Bluetooth: 5.0, A2DP, EDR, LE. GPS: A-GPS, GLONASS, BDS, GALILEO	Seven wireless interfaces now found in the Samsung Galaxy Note 8 high-end smartphone - Frequency Division Duplex Cellular, Time Division Duplex Cellular, Wi-Fi, Bluetooth, GNSS (Global Navigation Satellite System), Near-Field Communication, and Wireless Charging	Samsung Galaxy's "Find My Mobile" remotely locate the phone via its onboard GPS chip, remotely lock the device with a passcode and remotely cause the device to emit a loud ring. The Samsung Galaxy Note 8 capable of automatically transmitting a signal to lock after several failed log in attempts.

Claim	Evidence
32. The communication device [of claim 11] wherein the communication device having products to be monitored, the devices that are monitoring, communication devices, communication equipment can be grouped into anti-terrorist product groupings based on the categories of similarities of design of at least one of; sensors, software, interfaces, detector cases, locks, mobile communication devices, handheld communication devices, vehicle slowing and stopping devices, specification… similarities in material composition…; similarities in security problems of at least one of; theft, detection for chemical, biological, radiological, nuclear, explosive compounds and agents, detection for weapons of mass destruction, biometrics for identifying terrorist, scanning to identify a terrorist threat; grouping security devices to form a network of ubiquitous sensing… wherein the communication device receives a signal via any of one or more products in any product grouping categories;	Seven wireless interfaces now found in the high-end Samsung Galaxy Note 8 smartphone - Frequency Division Duplex Cellular, Time Division Duplex Cellular, Wi-Fi, Bluetooth, GNSS (Global Navigation Satellite System), Near-Field Communication, and Wireless Charging. The Samsung Galaxy Note 8 include receivers for GPS. The Samsung Galaxy Note 8 Edge is smart lock enabled, meaning you won't need to offer up a fingerprint, pin or password to unlock the handset if a trusted Bluetooth device is near. The Note 8 instantly registers a fingerprint and unlocks. The Samsung Galaxy Note 8 heart rate monitor also known as a Biosensor - Pulse/Oxy IC.
25. The communication device [of claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection. wherein the at least one of the satellite connection, Bluetooth connection, WiFi connection, internet connection, radio frequency (RF) connection, cellular connection, broadband connection, long range radio frequency (RF) connection, or short range radio frequency (RF) connection is capable of signal communication with the transmitter, the receiver of the communication device, or transceivers of the products;	The Samsung Galaxy Note 8 can determine location using its built-in Global Positioning System (GPS) transmitter, Wi-Fi networks, and mobile networks. WLAN: Wi-Fi 802.11 a/b/g/n/ac, dual-band, Wi-Fi Direct, hotspot. Bluetooth: 5.0, A2DP, EDR, LE. GPS: A-GPS, GLONASS, BDS, GALILEO

Claim	Product
30. The communication device [of claim 11] wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition, voice recognition, face recognition, hand geometry, retina scan, iris scan, heart rate, pulse or signature, thereby allowing access to the product by authorized, trained, and equipped individuals and preventing access to the product by unauthorized, untrained, and unequipped individuals.	wherein the communication device is equipped with a biometric lock disabler that incorporates at least one of a fingerprint recognition, voice recognition, face recognition, hand geometry, retina scan, iris scan, or signature such that the communication device that is at least one of the cell phone, the smart phone, the desktop, the handheld, the PDA, the laptop or the computer terminal is locked by the biometric lock disabler to prevent unauthorized use;	One major feature that Samsung added to its Galaxy line of smartphones was the heart rate monitor. The health-focused technology heart rate sensor is cleverly positioned on the back of the phone and embedded into the same opening as the LED flash. Samsung only allows you to register 4 fingerprints to set-up the fingerprint scanner; a security feature for easy log-in and lock-out. Face Unlock is a security feature that uses facial recognition technology instead of a PIN or password. It unlocks the Samsung Galaxy
25. The communication device of [claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.	wherein the only type or types of communication with the transmitter and the receiver of the communication device and transceivers of the products is a type or types selected from the group consisting of satellite, Bluetooth, WiFi, internet, radio frequency (RF), cellular, broadband, long range radio frequency (RF), and short range radio frequency (RF).	The Samsung Galaxy Note 8 can determine location using its built-in Global Positioning System (GPS) transmitter, Wi-Fi networks, and mobile networks. WLAN: Wi-Fi 802.11 a/b/g/n/ac, dual-band, Wi-Fi Direct, hotspot. Bluetooth: 5.0, A2DP, EDR, LE. GPS: A-GPS, GLONASS, BDS, GALILEO

RESPONDENT'S MOBILE DEVICE
GALAXY NOTE 8

WIRELESS/ CELLULAR MODEM — 29

OPERATING SYSTEM (OS) — 27

RESPONDENT'S CENTRAL PROCESSING UNIT (CPU) — 26

GLOBAL POSITIONING SYSTEM (GPS) — 30

INTERNET WiFi — 28

GATEWAY - INTERFACE — 25

DISABLING LOCK MECHANISM AFTER MULTIPLE FAILED ATTEMPTS — 33

BIOMETRIC FINGERPRINT FACIAL IRIS — 32

RADIO FREQUENCY (RF) NEAR FIELD COMMUNICATION (NFC) — 31

SATELLITE — 14

INTERFACE — 24

CBRNE - H
DETECTION DEVICE:

PLACED IN, ON, UPON OR ADJACENT THE COMMUNICATION MONITORING, DETECTING CONTROLLING (CMDC) DEVICE

LOCATION CAPABILITY — 15

LOCATION CAPABILITY — 13

CPU — 11

SENSORS — 16

B — 20
N — 21
H — 22

C — 17
R — 18
E — 19

POWER SOURCE — 23

INTERFACE — 10

CELLULAR — 12

GATEWAY - INTERFACE — 6

COMPLAINANT'S
COMMUNICATION, MONITORING
DETECTING, CONTROLLING (CMDC) DEVICE

OPERATING SYSTEM (OS) — 4

WIRELESS/ CELLULAR MODEM — 2

COMPLAINANT'S CENTRAL PROCESSING UNIT (CPU) — 1

INTERNET WiFi — 5

GLOBAL POSITIONING SYSTEM (GPS) — 3

RADIO FREQUENCY (RF) NEAR FIELD COMMUNICATION (NFC) — 9

BIOMETRIC FINGERPRINT FACIAL IRIS — 8

DISABLING LOCK MECHANISM AFTER MULTIPLE FAILED ATTEMPTS — 7

1. Complainant's Central Processing Unit (CPU): [Patent RE43,990]; Claim 16. The communication device of claim 11 wherein the communication device can be adapted or incorporated with cell phone towers and satellites for use with satellite communication and/or a cell tower, wi-fi, wi-max, broadband, GPS, navigation, radio frequency (RF) chips, radio frequency (RF) sensors, radio frequency (RF) transceivers, and radio frequencies for short and long range transmissions interconnected to the central processing unit (cpu).

2. Wireless/Cellular Modem: [Patent RE43,990]; Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

3. Global Positioning System (GPS): [Patent RE43,990]; Claim12. The communication device of claim 11 wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).

4. Operating System (OS): [Patent RE43,990] Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

5. Internet WiFi: [Patent RE43,990]; Claim 12. The communication device of claim 11 wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).

6. Gateway – Interface: [Patent RE43,990]; Claim 32. The communication device of claim 11 wherein the communication device having products to be monitored, the devices that are monitoring, communication devices, communication equipment can be grouped into anti-terrorist product groupings based on the categories of similarities of design of at least one of; sensors, software, interfaces, detector cases, locks, mobile communication devices, handheld communication devices, vehicle slowing and stopping devices.

7. Disabling Lock Mechanism after Multiple Failed Attempts: [Patent RE43,990]; Claim 22. The communication device of claim 11 wherein the communication device is designed to be equipped with applications for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, using a smart phone, cell phone, PDA, laptop or desktop.

8. Biometric Fingerprint Facial Iris: [Patent RE43,990]; Claim 30. The communication device of claim 11 wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition...

9. Radio Frequency (RF) Near Field Communication (NFC): [Patent RE43,990]; Claim 23. The communication device of claim 11 wherein the communication device is designed to be equipped with a radio frequency (RF) chip for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, capable of a two-way, bi-directional radio frequency (RF) communication link that makes the communication device work as a radio frequency (RF) sensor or a radio frequency (RF) transceiver.

10. Interface: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

11. CPU: [Patent RE43,990]; Claim 108. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case can be adapted or incorporated with cell phone towers and satellites for use with at least one of satellite communication, a cell tower, wi-fi, wi-max, broadband, GPS, navigation, radio frequency (RF) chips, radio frequency (RF) sensors, radio frequency (RF) transceivers, and radio frequencies for short and long range transmissions interconnected to a central processing unit (cpu).

12. Cellular: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

13. Location Capability: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

14. Satellite: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

15. Location Capability: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

16. Sensors: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

17. Chemical Sensor: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

18. Radiological Sensor: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

19. Explosive Sensor: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

20. Biological Sensor: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

21. Nuclear Sensor: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

22. Human Sensor: [Patent RE43,990]; Claim 125. A multi-sensor detection system for monitoring products and capable of operating with at least one of a designated perimeter sensor, a range sensor, a human sensor, a light sensor, a video sensor, a tampering sensor, a breach sensor, a temperature sensor, or a door sensor for an unauthorized or unscheduled door opening, comprising: at least one communication device of a cell phone, a cell phone detector case, a smart phone, a handheld, a PDA, a laptop, or a computer terminal at a monitoring site, and wherein the communication device has a central processing unit (cpu); at least one sensor that is a designated perimeter sensor, range sensor, human sensor

23. Power Source: [Patent RE43,990]; Claim 80. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded detector case, sensor array, central processing unit (CPU), power source of fuel, electric, solar or battery, automatic/mechanical internal or external lock disabler, remote internal or external lock disabler, biometric reader, camera, light, video, or interface.

24. Interface: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

25. Gateway – Interface: With the CBRNE-H Detection Device, the smartphone is the gateway. Using smartphones as our gateway to the Internet of Things we can add more context into activities. A complete Internet of Things (IoT) system integrates four distinct components: sensors/devices, connectivity, data processing, and a user interface. The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet.

26. Respondent's Central Processing Unit (CPU): This is the "brain" of the smartphone. The central processing unit (CPU) receives commands, makes instant calculations, and sends signals throughout the device. How the parts of the processor work together: The CPU connectivity features (GPS, WiFi), and 3G/4G modem are the major components of a mobile processor that control the operation of some of the most powerful and power-efficient smartphones.

27. Operating System (OS): Mobile operating systems combine features of a personal computer operating system with other features useful for mobile or handheld use; usually including, and most of the following considered essential in modern mobile systems; a cellular, Bluetooth, Wi-Fi, Global Positioning System (GPS) mobile navigation, speech recognition, near field communication (NFC).

28. Internet / WiFi: Connected devices also generate massive amounts of Internet traffic, including loads of data that can be used to make the devices useful. The Internet of Things (IoT), also sometimes referred to as the Internet of Everything (IoE), consists of all the web-enabled devices that collect, send and act on data they acquire from their surrounding environments using embedded sensors, processors and communication hardware. These devices, often called "connected" or "smart" devices, can sometimes talk to other related devices, a process called machine-to-machine (M2M) communication. The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet.

29. Wireless/Cellular Modem: These components control your connection to the world. Broadly speaking, the RF Transceiver receives and transmits voice connections and the modem enables your phone to send and receive digital signals. When enabled with 4G LTE, the radio and modem have a high-speed cellular wireless network at their disposal, capable of speeds that mimic your home Wi-Fi connection. When working closely with the CPU and GPU, a 4G LTE modem can deliver seamless, fluid access from your LTE network to your applications.

30. Global Positioning System (GPS): Your smartphone's GPS receiver analyzes high-frequency radio waves sent out from each satellite, with synchronized clocks in both the receiver and satellite recording the time that signals are transmitted, with the GPS chip timing exactly how long it takes to get from the satellite to your mobile phone – and it knows the speed of the signal, so with both those pieces of information, it can

work out the distance from the satellite. As long as your mobile device is receiving signal from three or more satellites, it's possible to work out where you are, by calculating how far you are from each satellite.

31. Radio Frequency (RF) Near Field Communication (NFC): NFC is a method of wireless data transfer that detects and then enables technology in close proximity to communicate without the need for an internet connection. The tech involved is deceptively simple: an NFC chip operates as one part of a wireless link. Once it's activated by another chip, small amounts of data between the two devices can be transferred when held a few centimeters from each other.

32. Biometric Fingerprint, Facial, and Iris: Previously seen mostly in military devices and fixed installations, iris scanning is joining other biometric authentication methods (such as fingerprint scanning, facial recognition and voice recognition) intended to move mobile devices beyond the limitations of password-based security.

33. Disabling Lock Mechanism after Multiple Failed Attempts: If you or someone else enters the wrong passcode too many times, your device will disable itself temporarily. The device can be remotely wiped after the specified number of failed password attempts.

SAMSUNG GALAXY NOTE 8 SPECS

DOMESTIC ECONOMY:
VERSION N950U: USA – (QUALCOMM)

Versions: N950F (Single SIM: Europe, Australia); N950FD (Global Dual SIM: Europe, LATAM, Brazil; Australia); **N950U/U1 (USA)**; N950W (Canada); N9500 (China); N950N (South Korea)
Also known as Samsung Galaxy Note8 Duos with Dual SIM card slots.

NETWORK	Technology	<u>GSM / HSPA / LTE</u>
LAUNCH	Announced	2017, August
	Status	Available. Released 2017, September
BODY	Dimensions	162.5 x 74.8 x 8.6 mm (6.40 x 2.94 x 0.34 in)
	Weight	195 g (6.88 oz)
	Build	Front/back glass (Gorilla Glass 5) & aluminum frame
	SIM	Single SIM (Nano-SIM) or Hybrid Dual SIM (Nano-SIM, dual stand-by)
		- IP68 certified - dust/water proof over 1.5 meter and 30 minutes
		- Stylus
		- Samsung Pay (Visa, MasterCard certified)
DISPLAY	Type	Super AMOLED capacitive touchscreen, 16M colors
	Size	6.3 inches, 101.1 cm² (~83.2% screen-to-body ratio)
	Resolution	1440 x 2960 pixels, 18.5:9 ratio (~521 ppi density)
	Multitouch	Yes
	Protection	Corning Gorilla Glass 5
		- HDR10 compliant
		- 3D Touch (home button only)
		- Always-on display
PLATFORM	OS	**Android 7.1.1 (Nougat)**

	Chipset	Exynos 8895 Octa - EMEA **Qualcomm MSM8998 Snapdragon 835 - USA & China**
	CPU	Octa-core (4x2.3 GHz & 4x1.7 GHz) - EMEA **Octa-core (4x2.35 GHz Kryo & 4x1.9 GHz Kryo) - USA & China**
	GPU	Mali-G71 MP20 - EMEA Adreno 540 - USA & China
MEMORY	Card slot	microSD, up to 256 GB (uses SIM 2 slot) - dual SIM model only
	Internal	64/128/256 GB, 6 GB RAM
CAMERA	Primary	Dual 12 MP (26mm, f/1.7, PDAF & 52mm, f/2.4, AF), OIS, autofocus, 2x optical zoom, LED flash, check quality
	Features	1/2.55" sensor size, 1.4 μm pixel size @ 26 mm 1/3.6" sensor size, 1.0 μm pixel size @ 52 mm Geo-tagging, simultaneous 4K video and 9MP image recording, touch focus, **face/smile detection,** Auto HDR, panorama
	Video	2160p@30fps, 1080p@60fps, 720p@240fps, HDR, dual-video rec., check quality
	Secondary	8 MP, f/1.7, autofocus, 1/3.6" sensor size, 1.22 μm pixel size, 1440p@30fps, dual video call, Auto HDR
SOUND	Alert types	Vibration; MP3, WAV ringtones
	Loudspeaker	Yes
	3.5mm jack	Yes
		- 32-bit/384kHz audio - Active noise cancellation with dedicated mic
COMMS	WLAN	**Wi-Fi 802.11 a/b/g/n/ac, dual-band, Wi-Fi Direct, hotspot**
	Bluetooth	**5.0, A2DP, EDR, LE**
	GPS	**Yes, with A-GPS, GLONASS, BDS, GALILEO**

	NFC	**Yes**
	Radio	No
	USB	3.1, Type-C 1.0 reversible connector
FEATURES	**Sensors**	**Iris scanner, fingerprint (rear-mounted),** **heart rate**, SpO2
		accelerometer, gyro, proximity, compass, barometer,
	Messaging	SMS(threaded view), MMS, Email, Push Mail, IM
	Browser	HTML5
	Java	No
		- Samsung Desktop Experience support
		- Fast battery charging (Quick Charge 2.0)
		- Qi/PMA wireless charging (market dependent)
		- ANT+ support
		- **Bixby natural language commands and dictation**
		- MP4/DivX/XviD/WMV/H.265 player
		- Photo/video editor
BATTERY		Non-removable Li-Ion 3300 mAh battery
	Talk time	Up to 22 h (3G)
	Music play	Up to 74 h
MISC	**Colors**	Midnight Black, Maple Gold, Orchid Grey, Deep Sea Blue, Star Pink (Taiwan only)
	Price	About 1000 EUR
TESTS	**Performance**	Basemark OS II: 3374 / Basemark OS II 2.0: 3333
		Basemark X: 40890
	Display	Contrast ratio: Infinite (nominal), 4.148(sunlight)
	Camera	Photo / Video
	Loudspeaker	Voice 67dB / Noise 69dB / Ring 71dB
	Audio quality	Noise -92.5dB / Crosstalk -93.2dB
	Battery life	Endurance rating 89h

Technical Rational

COMPLAINANT'S DEVICE: CMDC

SAMSUNG GEAR S3 CLASSIC

RESPONDENT'S MOBILE DEVICE: SAMSUNG GALAXY NOTE 8

Samsung Gear S3 (electronic device industry and wearable medical device industry); Samsung Galaxy Note 8 (mobile device industry)	Patent #: 9,589,439; Independent Claim 19	Patent #: RE 43,990; Dependent Claims
Able to pair Samsung Gear S3 Classic with a Samsung phone, most Android phones, and iPhones. Around the back of the watch is a chem/bio optical heart rate sensor that delivers continuous tracking and heart rate readings during exercise. There's built-in GPS to track activities like running and cycling, plus a host of sensors including a heart rate monitor, barometer and speedometer. Samsung's built-in GPS for sports tracking and sending out SOS alerts. The addition of Under Armour's app suite means iPhone users can now get more out of the Gear S3 as a fitness device. Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)	A multi-sensor detection system for detecting at least one explosive, nuclear, contraband, chemical, biological, human, radiological agent, or compound, comprising:	118. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

Claim	Element	Evidence
118. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.	a plurality of sensors for detecting at least one chemical, biological, radiological, explosive, nuclear, human, or contraband agent or compound, capable of being disposed within, on, upon or adjacent a multi-sensor detection device;	Around the back of the watch is a chem/bio optical heart rate sensor (also classified as a human heart rate sensor) that delivers continuous tracking and heart rate readings during exercise. There's a built-in GPS to track activities like running and cycling, plus a host of sensors including a heart rate monitor, barometer and speedometer
118. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.	monitoring equipment comprising at least one of a computer, personal computer (PC), laptop, notebook PC, handheld, cell phone, personal digital assistant (PDA) or smart phone for at least one of a receipt or transmission of signals therebetween;	Able to pair Samsung Gear S3 Classic with a Samsung phone, most Android phones, and iPhones
92. The multi-sensor detection system [of claim 81], further comprising a global positioning system (GPS) receiver adapted for communication with at least one satellite.	at least one cell phone tower interconnected to the monitoring equipment for sending signals thereto and receiving signals therefrom or at least one satellite capable of transmitting signals to the monitoring equipment;	Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)

25. The communication device [of claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.	at least one satellite or at least one cell phone tower capable of signal communication between the multi-sensor detection device and the monitoring equipment;	Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)
12. The communication device [of claim 11] wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).	at least one internet connection capable of communication between the multi-sensor detection device and the monitoring equipment;	Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)

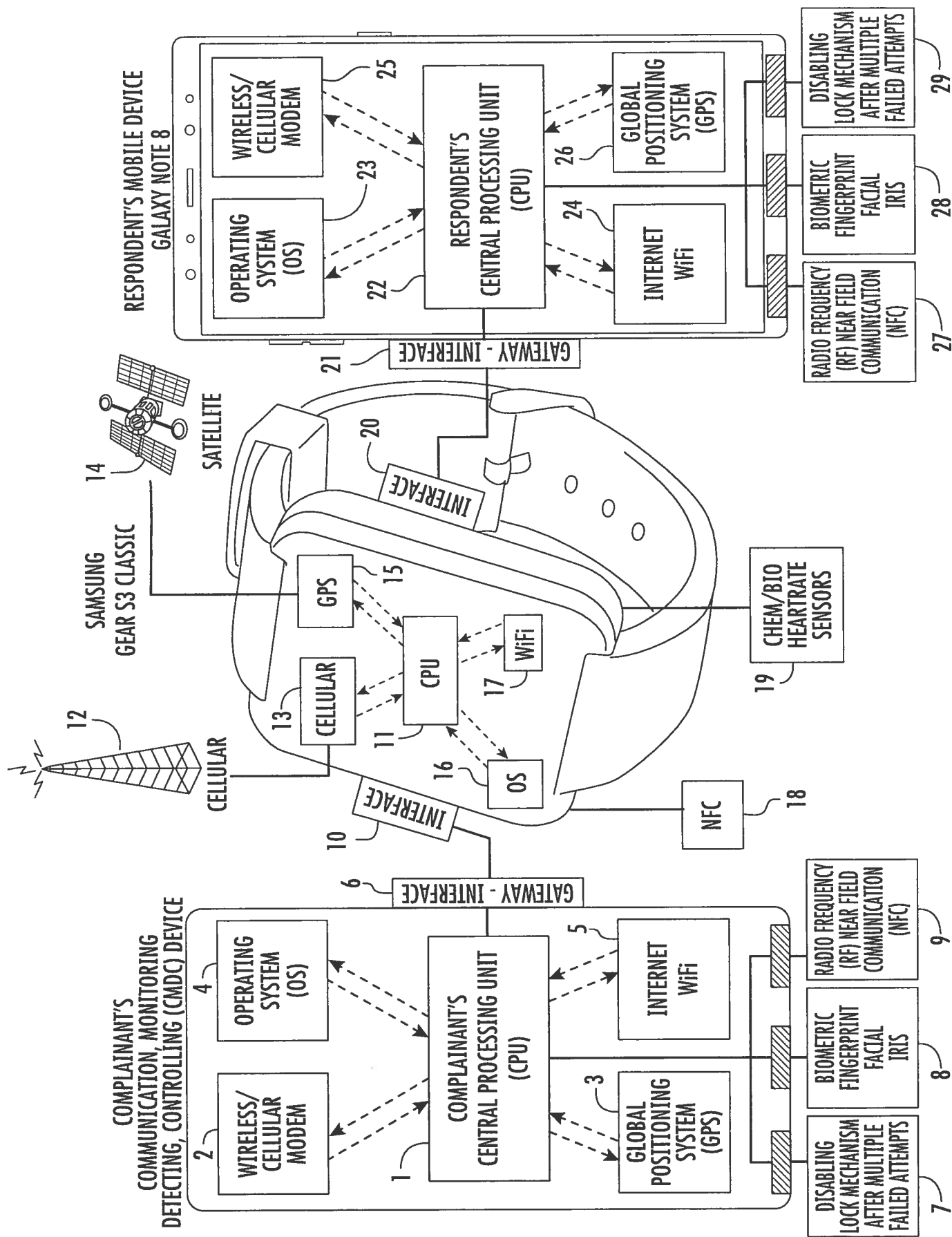|		
Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)	whereupon a signal sent to a receiver of the multi-sensor detection device from a satellite; or to a cell phone tower; or through at least one of a short range radio frequency or a long range radio frequency; causes a signal to be sent to the monitoring equipment that includes at least one of location data or sensor data;	92. The multi-sensor detection system [of claim 81], further comprising a global positioning system (GPS) receiver adapted for communication with at least one satellite.

124. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have products to be monitored, the devices that are monitoring, communication devices, communication equipment can be grouped into anti-terrorist product groupings based on the categories of similarities of design of at least one of: sensors, software, interfaces, detector cases, locks, mobile communication devices, handheld communication devices...; similarities in material composition of at least one of: steel, stainless steel, composites, brass, copper, aluminum, fiber, silicon, plastic, combining of materials parts or elements to form a whole; similarities in security problems of at least one of: theft, detection for chemical, biological, radiological, nuclear, explosive compounds and agents, detection for weapons of mass destruction, biometrics for identifying terrorist, scanning to identify a terrorist threat; grouping security devices to form a network of ubiquitous sensing and detecting.	wherein the monitoring equipment or multi-sensor detection device receives a signal via any of one or more products of any product grouping categories;	Able to pair Samsung Gear S3 Classic with a Samsung phone, most Android phones, and iPhones. Around the back of the watch is a chem/bio optical heart rate sensor that delivers continuous tracking and heart rate readings during exercise. There's built-in GPS to track activities like running and cycling, plus a host of sensors including a heart rate monitor, barometer and speedometer. Samsung's built-in GPS for sports tracking and sending out SOS alerts. The addition of Under Armour's app suite means iPhone users can now get more out of the Gear S3 as a fitness device. Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)

	12. The communication device [of claim 11] wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).
Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)	wherein at least one of a satellite connection, Bluetooth connection, WiFi connection, internet connection, radio frequency (RF) connection, cellular connection, broadband connection, long range radio frequency connection, or short range radio frequency (RF) connection is capable of signal communication with the transmitter, a receiver of the monitoring equipment, the multi-receiver of the sensor detection device, or transceivers of the products;

Samsung only allows you to register 4 fingerprints to set-up the fingerprint scanner; a security feature for easy log-in and lock-out. Samsung's new Face unlock feature uses the front-facing camera to identify the user and unlock the device. Samsung has included an iris scanning method, which uses special sensors on the front of the phone to identify you and unlock the device. Iris scanning is considered one of the most secure biometric methods. After several unsuccessful log-in attempts using a passcode or fingerprint, a Samsung device automatically locks itself up as a security feature. If user is unable to log in after doing all the security layers, there's no other option but to have the phone unlocked. Samsung's near-field communication (NFC) enabled smartphone: slide hand on the back and the NFC Ring can unlock it. The NFC Ring comes with two special NFC tag inlays inside the ring. The NFC Ring can be used to unlock & control mobile devices.

wherein the monitoring equipment is equipped with a biometric lock disabler that incorporates at least one of a fingerprint recognition, voice recognition, face recognition, hand geometry, retina scan, iris scan or signature such that the monitoring device that is at least one of the computer, the laptop, the notebook, the PC, the handheld, the cell phone, the PDA, or the smart phone is locked by the biometric lock disabler to prevent unauthorized use;

99. The multi-sensor detection system [of claim 81], wherein the multi sensor detection device is capable of transmitting biometric and authentication data including, but is not limited to, fingerprint recognition, voice recognition, face recognition, hand geometry, retina scan, iris scan, heart rate, pulse and signature.

25. The communication device of [claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.	
wherein the only type or types of communication with the transmitter and the receiver of the communication device and transceivers of the products is a type or types selected from the group consisting of satellite, Bluetooth, WiFi, internet, radio frequency (RF), cellular, broadband, long range radio frequency, and short range radio frequency (RF).	Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)

1. Complainant's Central Processing Unit (CPU): [Patent RE43,990]; Claim 16. The communication device of claim 11 wherein the communication device can be adapted or incorporated with cell phone towers and satellites for use with satellite communication and/or a cell tower, wi-fi, wi-max, broadband, GPS, navigation, radio frequency (RF) chips, radio frequency (RF) sensors, radio frequency (RF) transceivers, and radio frequencies for short and long range transmissions interconnected to the central processing unit (cpu).

2. Wireless/Cellular Modem: [Patent RE43,990]; Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

3. Global Positioning System (GPS): [Patent RE43,990]; Claim12. The communication device of claim 11 wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).

4. Operating System (OS): [Patent RE43,990] Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

5. Internet WiFi: [Patent RE43,990]; Claim 12. The communication device of claim 11 wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).

6. Gateway – Interface: [Patent RE43,990]; Claim 32. The communication device of claim 11 wherein the communication device having products to be monitored, the devices that are monitoring, communication devices, communication equipment can be grouped into anti-terrorist product groupings based on the categories of similarities of design of at least one of; sensors, software, interfaces, detector cases, locks, mobile communication devices, handheld communication devices, vehicle slowing and stopping devices.

7. Disabling Lock Mechanism after Multiple Failed Attempts: [Patent RE43,990]; Claim 22. The communication device of claim 11 wherein the communication device is designed to be equipped with applications for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, using a smart phone, cell phone, PDA, laptop or desktop.

8. Biometric Fingerprint Facial Iris: [Patent RE43,990]; Claim 30. The communication device of claim 11 wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition...

9. Radio Frequency (RF) Near Field Communication (NFC): [Patent RE43,990]; Claim 23. The communication device of claim 11 wherein the communication device is designed to be equipped with a radio frequency (RF) chip for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, capable of a two-way, bi-directional radio frequency (RF) communication link that makes the communication device work as a radio frequency (RF) sensor or a radio frequency (RF) transceiver.

10. Interface: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

11. CPU: [Patent RE43,990]; Claim 108. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case can be adapted or incorporated with cell phone towers and satellites for use with at least one of satellite communication, a cell tower, wi-fi, wi-max, broadband, GPS, navigation, radio frequency (RF) chips, radio frequency (RF) sensors, radio frequency (RF) transceivers, and radio frequencies for short and long range transmissions interconnected to a central processing unit (cpu).

12. Cellular: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

13. Cellular: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

14. Satellite: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

15. GPS: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component

16. Operating System: [Patent RE43,990] Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

17. Wi-Fi: [Patent RE43,990]; Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

18. NFC: [Patent RE43,990]; Claim 23. The communication device of claim 11 wherein the communication device is designed to be equipped with a radio frequency (RF) chip for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, capable of a two-way, bi-directional radio frequency (RF) communication link that makes the communication device work as a radio frequency (RF) sensor or a radio frequency (RF) transceiver.

19. Chem/Bio Heart Rate Sensors: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

20. Interface: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

21. Gateway – Interface: With the smartwatch, the smartphone is the gateway. Using smartphones as our gateway to the Internet of Things we can add more context into activities. A complete Internet of Things (IoT) system integrates four distinct components: sensors/devices, connectivity, data processing, and a user interface. The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet. With an open gateway architecture, any smartwatch could ask any smartphone it encounters to agree to act as a gateway. The phone could then provide a connection for any low-bandwidth Internet applications running on the device.

22. Respondent's Central Processing Unit (CPU): This is the "brain" of the smartphone. The central processing unit (CPU) receives commands, makes instant calculations, and sends signals throughout the device. How the parts of the processor work together: The CPU connectivity features (GPS, WiFi), and 3G/4G modem are the major components of a mobile processor that control the operation of some of the most powerful and power-efficient smartphones.

23. Operating System (OS): Mobile operating systems combine features of a personal computer operating system with other features useful for mobile or handheld use; usually including, and most of the following considered essential in modern mobile systems; a cellular, Bluetooth, Wi-Fi, Global Positioning System (GPS) mobile navigation, speech recognition, near field communication (NFC).

24. Internet / WiFi: Connected devices also generate massive amounts of Internet traffic, including loads of data that can be used to make the devices useful. The Internet of Things (IoT), also sometimes referred to as the Internet of Everything (IoE), consists of all the web-enabled devices that collect, send and act on data they acquire from their surrounding environments using embedded sensors, processors and communication hardware. These devices, often called "connected" or "smart" devices, can sometimes talk to other related devices, a process called machine-to-machine (M2M) communication. The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet.

25. Wireless/Cellular Modem: These components control your connection to the world. Broadly speaking, the RF Transceiver receives and transmits voice connections and the modem enables your phone to send and receive digital signals. When enabled with 4G LTE, the radio and modem have a high-speed cellular wireless network at their disposal, capable of speeds that mimic your home Wi-Fi connection. When working closely with the CPU and GPU, a 4G LTE modem can deliver seamless, fluid access from your LTE network to your applications.

26. Global Positioning System (GPS): Your smartphone's GPS receiver analyzes high-frequency radio waves sent out from each satellite, with synchronized clocks in both the receiver and satellite recording the time that signals are transmitted, with the GPS chip timing exactly how long it takes to get from the satellite to your mobile phone – and it knows the speed of the signal, so with both those pieces of information, it can work out the distance from the satellite. As long as your mobile device is receiving signal from three or more satellites, it's possible to work out where you are, by calculating how far you are from each satellite.

27. Radio Frequency (RF) Near Field Communication (NFC): NFC is a method of wireless data transfer that detects and then enables technology in close proximity to communicate without the need for an internet connection. The tech involved is deceptively simple: an NFC chip operates as one part of a wireless link. Once it's activated by another chip, small amounts of data between the two devices can be transferred when held a few centimeters from each other.

28. Biometric Fingerprint, Facial, Iris: Previously seen mostly in military devices and fixed installations, iris scanning is joining other biometric authentication methods (such as fingerprint scanning, facial recognition and voice recognition) intended to move mobile devices beyond the limitations of password-based security.

29. Disabling Lock Mechanism after Multiple Failed Attempts: If you or someone else enters the wrong passcode too many times, your device will disable itself temporarily. The device can be remotely wiped after the specified number of failed password attempts.

SAMSUNG GEAR S3 CLASSIC SPECS

DOMESTIC ECONOMY:
USA - Samsung Gear S3 Classis requires at least a Samsung Smartphone

NETWORK	Technology	No cellular connectivity
LAUNCH	Announced	2016, August
	Status	Available. Released 2016, November
BODY	Dimensions	49 x 46 x 12.9 mm (1.93 x 1.81 x 0.51 in)
	Weight	59 g (2.08 oz)
	Build	Stainless Steel 316L
	SIM	No
		- Samsung Pay - IP68 certified - dust/water proof over 1.5 meter and 30 minutes - Compatible with standard 22mm straps
DISPLAY	Type	Super AMOLED capacitive touchscreen, 16M colors
	Size	1.3 inches, 10.8 cm² (~48.1% screen-to-body ratio)
	Resolution	360 x 360 pixels, 1:1 ratio (~278 ppi density)
	Multitouch	Yes
	Protection	Corning Gorilla Glass SR+
		- Always-on display - Rotating bezel
PLATFORM	OS	**Tizen-based wearable platform 2.3.2**
	Chipset	**Exynos 7270**
	CPU	**Dual-core 1.0 GHz**
MEMORY	Card slot	No
	Internal	4 GB, 768 MB RAM
CAMERA		No

SOUND

Alert types	Vibration; MP3, WAV ringtones
Loudspeaker	Yes
3.5mm jack	No

COMMS

WLAN	**Wi-Fi 802.11 b/g/n**
Bluetooth	**4.2, A2DP, LE**
GPS	**Yes, GLONASS**
NFC	**Yes**
Radio	No
USB	No

FEATURES

Sensors	Accelerometer, gyro, **heart rate**, barometer
Messaging	SMS(threaded view), Email, IM
Browser	No
Java	No
	- WPC wireless charging
	- **S-Voice natural language commands and dictation**
	- MP3/M4A/AAC/WAV player
	- **Photo** viewer
	- Voice memo/dial/commands

BATTERY

	Non-removable Li-Ion 380 mAh battery
Stand-by	Up to 72 h (mixed usage) (2G) / Up to 72 h (3G)

MISC

Colors	Silver
Price	About 390 EUR

SAMSUNG GALAXY S8

Technical Rational

COMPLAINANT'S DEVICE: CMDC

INTERCONNECTION CAPABILITIES

RESPONDENT'S MOBILE DEVICE: SAMSUNG GALAXY S8

Samsung Galaxy S8 (mobile device industry) interconnected to: "Samsung SmartThings Hub" (home security industry); Samsung Gear S3 (electronic device industry); "Volkswagen Car-Net e-Remote" (locking device)	Patent #: 9,589,439; Independent Claim 22	Patent #: RE 43,990; Dependent Claims
The Samsung Galaxy S8 communication, monitoring, detecting, controlling (CMDC) device. The SmartThings app turns the Samsung Galaxy S8 smartphone into a remote to control all of the smart devices in your home. Available for download for Android, iOS and Windows. The Samsung SmartThings Hub communicates information from your smartphone to all of your different connected products–regardless of their wireless protocol–so that you can easily monitor and control them from the free SmartThings app. Samsung created new version of Volkswagen app which gives control over key features of your car directly from the smartwatch – Samsung Gear S3 Classic. The Gear S3, will need to be connected to a mobile device (e.g. Galaxy S8). Samsung's partnership with Volkswagen, for smartphone connections via Car Mode for Galaxy, an app powered by MirrorLink. Car Mode for Galaxy. Volkswagen Car-Net e-Remote, if own a VW and Gear S3, enables check that car is locked with smartwatch.	A communication device of at least one of a cell phone, a smart phone, a desktop, a handheld, a personal digital assistant (PDA), a laptop, or a computer terminal, comprising:	18. The communication device of claim 11 wherein the communication device having a basic monitoring terminal can be adapted and incorporated to include desktop computers, notebook, PC's, laptops, cell phones, smart phones, LCD monitors, and satellite monitoring

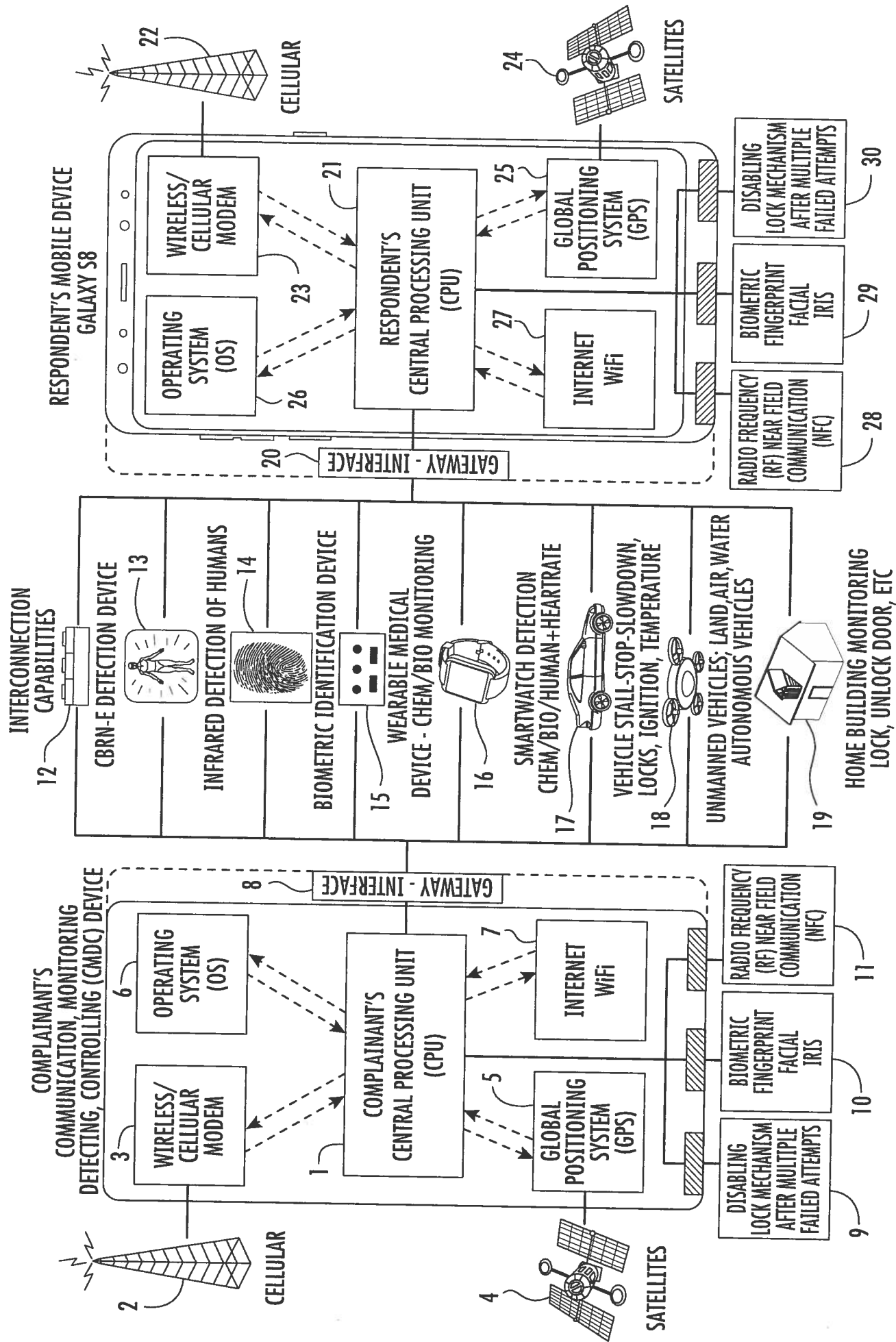|	
118. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.	The Gear S3 Classic need to connect to a mobile device (e.g. Galaxy S8) using the Samsung Gear application. The application must be installed on the mobile device (e.g. Galaxy S8). The Gear S3 Classic sensors include: Accelerometer; Gyroscope; Heart Rate; and, Barometer. Connectivity include: 802.11 b/g/n WiFi; Bluetooth 4.2 A2DP, LE; and near-field communication (NFC). GPS include: a GPS receiver and two apps, Nike+ and S Health, that include GPS tracking support; and Glonass (satellite). Platform: operating system (OS) Tizen-based wearable platform 2.3.2.; chipset Exynos 7270; Central processing unit (CPU) dual-core 1.0 Ghz
at least one of a chemical sensor, a biological sensor, an explosive sensor, a human sensor, a contraband sensor, or a radiological sensor; that is wired or wireless, capable of being disposed within, on, upon or adjacent the communication device;	
12. The communication device [of claim 11] wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).	Samsung Galaxy S8 CPU (Central Processing Unit) Octa-core (4x2.35 GHz Kryo & 4x1.9 GHz Kryo - USA & China - otherwise known as a processor - is an electronic circuit that executeS computer programs. The Samsung Galaxy S8 smartphones don't just use "processors" , they use what's called a System-on-a-chip (SoC). The SoC is the equivalent of a computer motherboard, including main processor, graphics processor and memory, on a single chip. The CPU is nonetheless a must-have component of the SoC. Modern SoCs have two, and soon four, processors cores ("multi-core"). **Wireless & Cellular: Chipset; Qualcomn MSM8998 Snapdragon 835 - USA & China**
at least one of a central processing unit (CPU), a network processor, or a front end processor for communication between a host computer and other devices;	

Claim language	Claim element	Samsung Galaxy S8 evidence
28. The communication device [of claim 11] wherein the communication device can send and receive signals, send and receive warnings, send and receive commands, send and receive data, information and report the status of the sensors and operational equipment systems to and from a cell phone, smart phone, PDA or handheld device.	a transmitter for transmitting signals and messages to at least one of a multi-sensor detection device, a cell phone detection device, or a locking device;	The Samsung Galaxy S8 capable of automatically transmitting a signal to lock after several failed log-in attempts. The Samsung Galaxy S8 "Fingertip Heart Rate Monitor" detection device (e.g. cell phone detection device) is a built-in monitor that measures heart rate from a fingertip using a biosensor.
28. The communication device [of claim 11] wherein the communication device can send and receive signals, send and receive warnings, send and receive commands, send and receive data, information and report the status of the sensors and operational equipment systems to and from a cell phone, smart phone, PDA or handheld device.	a receiver for receiving signals, data or messages from at least one of a multi-sensor detection device, a cell phone detection device, or a locking device;	The Samsung Galaxy S8 capable of receiving a signal to reset (e.g. unlock; locking device) the phone. The Samsung Galaxy S8 "Fingertip Heart Rate Monitor" detection device (e.g. cell phone detection device) is a built-in monitor that measures heart rate from a fingertip using a biosensor.
25. The communication device [of claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.	at least one of a satellite connection, Bluetooth connection, WiFi connection, internet connection, cellular connection, long and/or short range radio frequency (RF) connection, or GPS connection;	Cellular data connection: The connection that the Galaxy S8 uses to exchange data over the air using your mobile operator's cellular network. Cellular network connection: the Galaxy S8 uses for voice and data connect. This network is managed by the mobile operator. WLAN: Wi-Fi 802.11 a/b/g/n/ac, dual-band, Wi-Fi Direct, hotspot. Bluetooth: 5.0, A2DP, LE. GPS, A-GPS, Glonass (satellite), BDS, Galileo (satellite)

30. The communication device [of claim 11] wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition, voice recognition, face recognition, hand geometry, retina scan, iris scan, heart rate, pulse or signature, thereby allowing access to the product by authorized, trained, and equipped individuals and preventing access to the product by unauthorized, untrained, and unequipped individuals.	22. The communication device [of claim 11] wherein the communication device is designed to be equipped with applications for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, using a smart phone, cell phone, PDA, laptop or desktop
the communication device being at least a fixed, portable or mobile communication device, equipped with at least one wired or wireless sensor for the detection of humans;	the communication device being equipped to receive signals from or send signals to engage (lock), disengage (unlock), or disable (make unavailable) locks;
Seven wireless interfaces in the Samsung Galaxy S8 smartphone - Frequency Division Duplex Cellular, Time Division Duplex Cellular, Wi-Fi, Bluetooth, GNSS (Global Navigation Satellite System), Near-Field Communication, and Wireless Charging. Samsung allows 4 fingerprints to set-up the fingerprint scanner; for log-in and lock-out. Samsung's Face unlock uses the front-facing camera to identify the user and unlock the device. Samsung's iris scanning method, uses special sensors on front of phone to identify and unlock the device.	After several unsuccessful log-in attempts using a passcode or fingerprint, a Samsung device automatically locks itself up as a security feature. If user is unable to log in after doing all the security layers, there's no other option but to have the phone unlocked. Samsung's near-field communication (NFC) enabled smartphone: slide hand on the back and the NFC Ring can unlock it. The NFC Ring comes with two special NFC tag inlays inside the ring. The NFC Ring can be used to unlock & control mobile devices

Claim	Description
30. The communication device [of claim 11] wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition, voice recognition, face recognition, hand geometry, retina scan, iris scan, heart rate, pulse or signature, thereby allowing access to the product by authorized, trained, and equipped individuals and preventing access to the product by unauthorized, untrained, and unequipped individuals.	the communication device being equipped with biometrics that incorporates at least one of a fingerprint recognition or a face recognition to at least one of gain access to the device or to prevent unauthorized use;	Samsung only allows you to register 4 fingerprints to set-up the fingerprint scanner; a security feature for easy log-in and lock-out. Samsung's new Face unlock feature uses the front-facing camera to identify the user and unlock the device. Samsung has included an iris scanning method, which uses special sensors on the front of the phone to identify you and unlock the device. Iris scanning is considered one of the most secure biometric methods
20. The communication device [of claim 11] wherein the communication device can be interconnected through wire or wireless for communication, signals, commands and transmission of data.	the communication device being capable of wireless near-field communication (NFC) which allows radio frequency (RF) data to be at least one of received or transferred between the communication device and at least one tag that is read by the communication device;	Seven wireless interfaces now found in the Samsung Galaxy S8 high-end smartphone - Frequency Division Duplex Cellular, Time Division Duplex Cellular, Wi-Fi, Bluetooth, GNSS (Global Navigation Satellite System), Near-Field Communication, and Wireless Charging
25. The communication device [of claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.	whereupon a signal sent to the receiver of at least one of a multi-sensor detection device, a cell phone detection device, or a locking device from a satellite or a cell phone tower or through at least one of a Bluetooth connection, a WiFi connection, an internet connection, a cellular connection, a GPS connection, a short range radio frequency (RF) connection, or a long range radio frequency (RF) connection, causes a signal that includes at least one of location data or sensor data to be sent to the communication device; and	Cellular data connection: The connection that the Galaxy S8 uses to exchange data over the air using your mobile operator's cellular network. Cellular network connection: The network that the Galaxy S8 uses for making voice and data connections. This network is managed by the mobile operator.WLAN: Wi-Fi 802.11, Wi-Fi Direct, hotspot. Bluetooth: 5.0, A2DP, LE. The Galaxy can determine location using its built-in Global Positioning System (GPS) transmitter, Wi-Fi networks, and mobile networks.

28. The communication device [of claim 11] wherein the communication device can send and receive signals, send and receive warnings, send and receive commands, send and receive data, information and report the status of the sensors and operational equipment systems to and from a cell phone, smart phone, PDA or handheld device.	wherein at least one of a satellite connection, Bluetooth connection, WiFi connection, internet connection, cellular connection, long range radio frequency (RF) connection, or short range radio frequency (RF) connection, capable of signal communication with the transmitter of the communication device, the receiver of the communication device, or the central processing unit (CPU).
	The Samsung Galaxy S8 capable of automatically transmitting a signal to lock after several failed log-in attempts. The Samsung Galaxy S8 capable of receiving a signal to reset (e.g. unlock; locking device). Thereby activating or deactivating a security system. **Chipset: Qualcomm MSM8998 Snapdragon 835 - USA & China**

1. Complainant's Central Processing Unit (CPU): [Patent RE43,990]; Claim 16. The communication device of claim 11 wherein the communication device can be adapted or incorporated with cell phone towers and satellites for use with satellite communication and/or a cell tower, wi-fi, wi-max, broadband, GPS, navigation, radio frequency (RF) chips, radio frequency (RF) sensors, radio frequency (RF) transceivers, and radio frequencies for short and long range transmissions interconnected to the central processing unit (cpu).

2. Cellular: [Patent RE43,990]; Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

3. Wireless/Cellular Modem: [Patent RE43,990]; Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

4. Satellites: [Patent RE43,990]; Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

5. Global Positioning System (GPS): [Patent RE43,990]; Claim12. The communication device of claim 11 wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).

6. Operating System (OS): [Patent RE43,990] Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

7. Internet WiFi: [Patent RE43,990]; Claim 12. The communication device of claim 11 wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).

8. Gateway – Interface: [Patent RE43,990]; Claim 32. The communication device of claim 11 wherein the communication device having products to be monitored, the devices that are monitoring, communication devices, communication equipment can be grouped into anti-terrorist product groupings based on the categories of similarities of design of at least one of; sensors, software, interfaces, detector cases, locks, mobile communication devices, handheld communication devices, vehicle slowing and stopping devices.

9. Disabling Lock Mechanism after Multiple Failed Attempts: [Patent RE43,990]; Claim 22. The communication device of claim 11 wherein the communication device is designed to be equipped with applications for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, using a smart phone, cell phone, PDA, laptop or desktop.

10. Biometric Fingerprint, Facial, and Iris: [Patent RE43,990]; Claim 30. The communication device of claim 11 wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition...

11. Radio Frequency (RF) Near Field Communication (NFC): [Patent RE43,990]; Claim 23. The communication device of claim 11 wherein the communication device is designed to be equipped with a radio frequency (RF) chip for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, capable of a two-way, bi-directional radio frequency (RF) communication link that makes the communication device work as a radio frequency (RF) sensor or a radio frequency (RF) transceiver.

12. CBRN-E Detection Device: [Patent RE43,990]; Claim 26. The communication device of claim 11 wherein the communication device has a plurality of sensors for detecting the chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which is capable of being disposed within each communication device.

13. Infrared Detection of Humans: [Patent RE43,990]; Claim 31. The communication device of claim 11 wherein the communication device is designed to be used as a standalone detection system for the detection of bombs that have been surgically implanted by using at least one of the human vitals sensors of; a heart sensor, a nerve sensor, a perspiration sensor, an inflammation sensor, a pulse sensor, a blood pressure sensor, a temperature sensor, a breath sensor, or a radiation sensor.

14. Biometric Identification Device: [Patent RE43,990]; Claim 30. The communication device of claim 11 wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition...

15. Wearable Medical Device – Chem/Bio Monitoring: [Patent RE43,990]; Claim 97. The multi-sensor detection system of claim 81, wherein the multi sensor detection device is capable of being embedded into; placed in, on, or adjacent to a product or area targeted for monitoring.

16. Smartwatch Detection Chem/Bio/Human/Heartrate: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

17. Vehicle Stall-Stop-Slowdown, Locks, Ignition, Temperature: [Patent RE43,990]; Claim 15. The communication device of claim 11 wherein the communication device capable of sending signals to the vehicle's operating equipment systems of at least one of, but not limited to, an ignition for starting and stopping, a lock for unlocking and locking, a horn for sounding; capable of receiving data and diagnostic information of the vehicle's operating equipment systems.

18. Unmanned Vehicles; Land, Air, Water Autonomous Vehicles: [Patent RE43,990]; Claim 15. The communication device of claim 11 wherein the communication device capable of sending signals to the vehicle's operating equipment systems of at least one of, but not limited to, an ignition

for starting and stopping, a lock for unlocking and locking, a horn for sounding; capable of receiving data and diagnostic information of the vehicle's operating equipment systems.

19. Home Building Monitoring Lock, Unlock Door, Etc.: [Patent RE43,990]; Claim 22. The communication device of claim 11 wherein the communication device is designed to be equipped with applications for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, using a smart phone, cell phone, PDA, laptop or desktop.

20. Gateway – Interface: With the smartwatch, the smartphone is the gateway. Using smartphones as our gateway to the Internet of Things we can add more context into activities. A complete Internet of Things (IoT) system integrates four distinct components: sensors/devices, connectivity, data processing, and a user interface. The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet.

21. Respondent's Central Processing Unit (CPU): This is the "brain" of the smartphone. The central processing unit (CPU) receives commands, makes instant calculations, and sends signals throughout the device. How the parts of the processor work together: The CPU connectivity features (GPS, WiFi), and 3G/4G modem are the major components of a mobile processor that control the operation of some of the most powerful and power-efficient smartphones.

22. Cellular: A smartphone is essentially a two-way radio, consisting of a radio transmitter and a radio receiver. When you chat with your friend on your smartphone, your phone converts your voice into an electrical signal, which is then transmitted via radio waves to the nearest cellular tower. The network of cell towers then relays the radio wave to your friend's smartphone, which converts it to an electrical signal and then back to sound again. In the basic form, a smartphone works just like a walkie-talkie.

23. Wireless/Cellular Modem: These components control your connection to the world. Broadly speaking, the RF Transceiver receives and transmits voice connections and the modem enables your phone to send and receive digital signals. When enabled with 4G LTE, the radio and modem have a high-speed cellular wireless network at their disposal, capable of speeds that mimic your home Wi-Fi connection. When working closely with the CPU and GPU, a 4G LTE modem can deliver seamless, fluid access from your LTE network to your applications.

24. Satellites: There are 24 satellites (with an additional three orbiting on standby - just in case), although your smartphone's GPS only needs to receive signals from a fraction of them at any one time, with three satellites your smartphone can calculate a 2D position and track your movement. Four or more satellites enables a 3D position, adding altitude to latitude and longitude, and allowing for more effective tracking.

25. Global Positioning System (GPS): Your smartphone's GPS receiver analyzes high-frequency radio waves sent out from each satellite, with synchronized clocks in both the receiver and satellite recording the time that signals are transmitted, with the GPS chip timing exactly how long it takes to get from the satellite to your mobile phone – and it knows the speed of the signal, so with both those pieces of information, it can

work out the distance from the satellite. As long as your mobile device is receiving signal from three or more satellites, it's possible to work out where you are, by calculating how far you are from each satellite.

26. Operating System (OS): Mobile operating systems combine features of a personal computer operating system with other features useful for mobile or handheld use; usually including, and most of the following considered essential in modern mobile systems; a cellular, Bluetooth, Wi-Fi, Global Positioning System (GPS) mobile navigation, speech recognition, near field communication (NFC)

27. Internet WiFi: Connected devices also generate massive amounts of Internet traffic, including loads of data that can be used to make the devices useful. The Internet of Things (IoT), also sometimes referred to as the Internet of Everything (IoE), consists of all the web-enabled devices that collect, send and act on data they acquire from their surrounding environments using embedded sensors, processors and communication hardware. These devices, often called "connected" or "smart" devices, can sometimes talk to other related devices, a process called machine-to-machine (M2M) communication. The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet.

28. Radio Frequency (RF) Near Field Communication (NFC): NFC is a method of wireless data transfer that detects and then enables technology in close proximity to communicate without the need for an internet connection. The tech involved is deceptively simple: an NFC chip operates as one part of a wireless link. Once it's activated by another chip, small amounts of data between the two devices can be transferred when held a few centimeters from each other.

29. Biometric Fingerprint, Facial, and Iris: Previously seen mostly in military devices and fixed installations, iris scanning is joining other biometric authentication methods (such as fingerprint scanning, facial recognition and voice recognition) intended to move mobile devices beyond the limitations of password-based security.

30. Disabling Lock Mechanism after Multiple Failed Attempts: If you or someone else enters the wrong passcode too many times, your device will disable itself temporarily. The device can be remotely wiped after the specified number of failed password attempts.

Technical Rational

COMPLAINANT'S DEVICE: CMDC

CBRNE-H DETECTION DEVICE

RESPONDENT'S MOBILE DEVICE: SAMSUNG GALAXY S8

"Cell-All": Samsung Galaxy S8 (Government Industry: Military; Law Enforcement; First Responders; other Gov't Employees)	Patent #: 9,589,439; Independent Claim 14	Patents: 8,106,752; & RE 43,990; Dependent Claims
Synkera presented the MikroKera Ultra Module at the DHS-S&T "Cell-All" demonstration in Los Angeles on Sept. 28, 2011. Synkera offers a digital module for use of MikroKera Ultra chemical sensors. Synkera has been funded by DHS S&T "Cell-All" project to develop sensors suitable for integration into cell phones (e.g. Samsung Galaxy S8). The Ultra is available with or without case. The MikroKera Ultra Module is interconnected to monitoring equipment through Bluetooth communications. The monitoring equipment is a Samsung Galaxy S8 smartphone with Android (O/S).	Monitoring equipment of at least one of products grouped together by common features in a product groupings category of design similarity comprising a computer terminal, personal computer (PC), laptop, desktop, notebook PC, handheld, cell phone, personal digital assistant (PDA) or smart phone interconnected to a product for communication therebetween, the monitoring equipment comprising:	18. The communication device [of claim 11] wherein the communication device having a basic monitoring terminal can be adapted and incorporated to include desktop computers, notebook, PC's, laptops, cell phones, smart phones, LCD monitors, and satellite monitoring.
MIT: A Samsung Galaxy smartphone-based sensing strategy can use chemiresponsive nanomaterials integrated into the circuitry of near-field communication tags to achieve portable detection and discrimination of gas phase chemicals (e.g., ammonia, hydrogen peroxide, cyclohexanone, and water). The galaxy's smartphone heart rate monitor is known as a Biosensor – Pulse/Oxy IC. The heart rate monitor shines a red/infrared light through the finger and measures the pulse as the heart beats. The fingerprint scanner: a touch sensor incorporated into the home button.	at least one of a chemical sensor, a biological sensor, an explosive sensor, a human sensor, a contraband sensor, or a radiological sensor; that is wired or wireless, capable of being disposed within, on, upon or adjacent the monitoring equipment;	118. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

Claim	Evidence
12. The communication device [of claim 11] wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).	Samsung Galaxy S8 CPU (Central Processing Unit) - otherwise known as a processor - is an electronic circuit that can execute computer programs. Modern microprocessors appear in everything from automobiles to mobile phones. **Wireless & Cellular: Chipset; Qualcomm MSM8998 Snapdragon 835 - USA & China. CPU: Octa-core (4x2.5 GHz Kryo & 4X1.9 GHz Kryo) - USA & China**
at least one of a central processing unit (CPU) for executing and carrying out the instructions of a computer program, a network processor which is specifically targeted at the networking application domain, or a front end processor for communication between a host computer and other devices;	
28. The communication device [of claim 11] wherein the communication device can send and receive signals, send and receive warnings, send and receive commands, send and receive data, information and report the status of the sensors and operational equipment systems to and from a cell phone, smart phone, PDA or handheld device.	The Samsung Galaxy S8 capable of receiving a signal from the factory to reset (unlock) the phone. Indicator icons: Shows the information needed to operate the device, such as the received or transmitted signal strength, device battery level, time, unread Emails, missed calls, etc. Infrared Blaster: Emits infrared signals used for controlling external devices.
a transmitter for transmitting signals and messages to at least one of a multi-sensor detection device, a maritime cargo container, a cell phone detection device;	
28. The communication device [of claim 11] wherein the communication device can send and receive signals, send and receive warnings, send and receive commands, send and receive data, information and report the status of the sensors and operational equipment systems to and from a cell phone, smart phone, PDA or handheld device.	The Samsung Galaxy S8 capable of receiving a signal from the factory to reset (unlock) the phone. Indicator icons: Shows the information needed to operate the device, such as the received or transmitted signal strength, device battery level, time, unread Emails, missed calls, etc. Infrared Blaster: Emits infrared signals used for controlling external devices.
a receiver for receiving signals, data or messages from at least one of the multi-sensor detection device, the maritime cargo container, the cell phone detection device;	

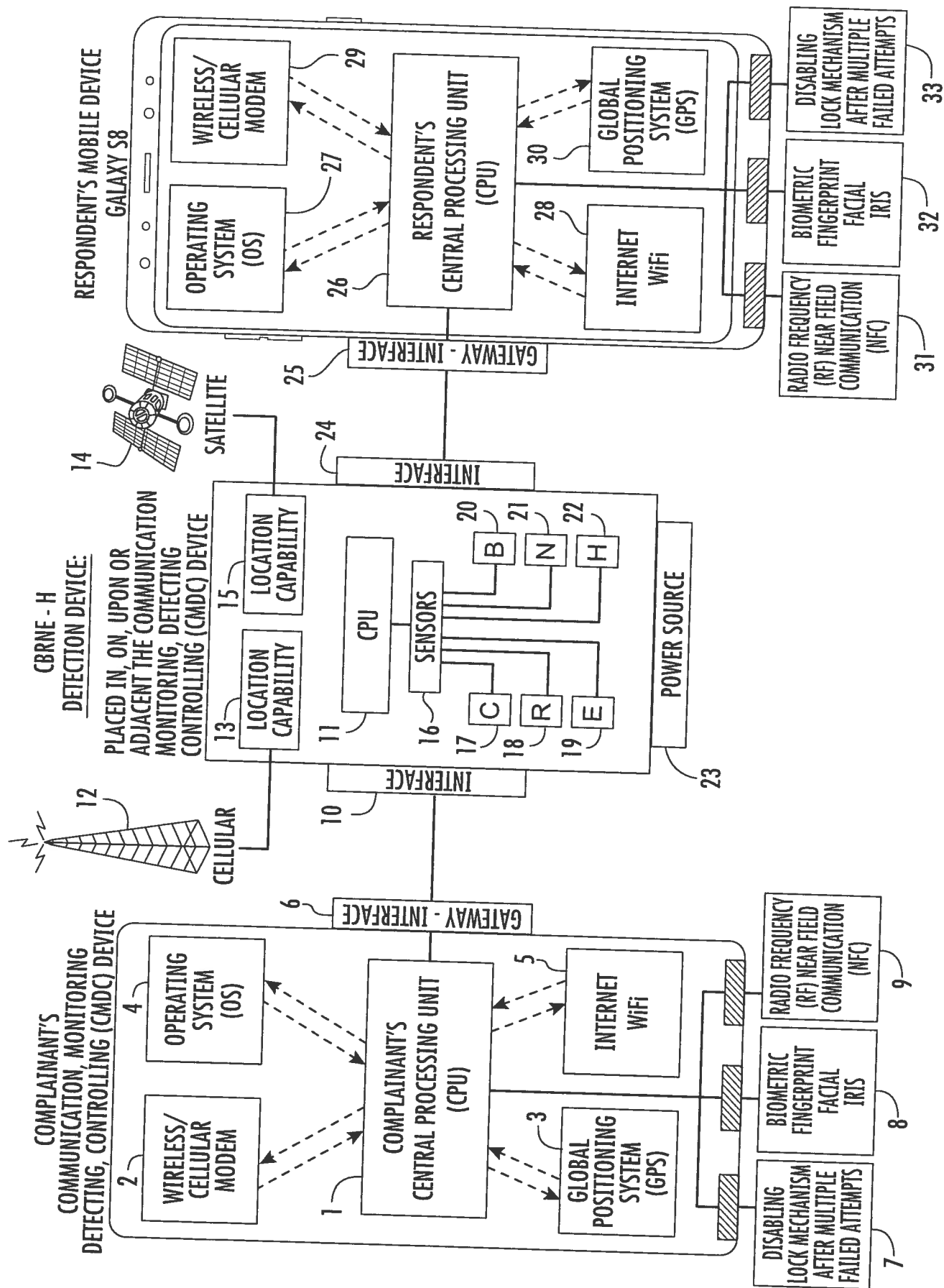|		
34. The automatic/mechanical lock disabler system [of claim 33] wherein the automatic/mechanical lock disabler is designed to be used with or without biometrics for authentication and identification, thereby allowing access to the product by authorized, trained and equipped individuals and preventing access to the product by unauthorized, untrained, and equipped individuals. (8,106,752)	a lock disabling mechanism that is able to engage (lock), or disengage (unlock), or disable (make unavailable) a product's lock, wherein the lock disabling mechanism disables the product's lock after a specific number of tries by an unauthorized user to disengage the lock by maintaining the product's lock in the current state of the product's lock regardless of input entered to change the state of the product's lock by the unauthorized user;	The Samsung Galaxy S8 Edge is smart lock enabled, meaning you won't need to offer up a fingerprint, pin or password to unlock the handset if a trusted Bluetooth device is near. The S8 instantly registers a fingerprint and unlocks. Samsung Galaxy's "Find My Mobile" remotely locate the phone via its onboard GPS chip, remotely lock the device with a passcode and remotely cause the device to emit a loud ring. The Samsung Galaxy S8 capable of automatically transmitting a signal to lock after several failed log-in attempts.
25. The communication device [of claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.	at least one of a satellite connection, Bluetooth connection, WiFi connection, internet connection, radio frequency (RF) connection, cellular connection, broadband connection, long range radio frequency (RF) connection, short range radio frequency (RF) connection, or GPS connection;	The Samsung Galaxy s8 can determine location using its built-in Global Positioning System (GPS) transmitter, Wi-Fi networks, and mobile networks. WLAN: Wi-Fi 802.11 a/b/g/n/ac, dual-band, Wi-Fi Direct, hotspot. Bluetooth: 5.0, A2DP, LE. GPS: A-GPS, GLONASS, BDS, GALILEO
20. The communication device [of claim 11] wherein the communication device can be interconnected through wire or wireless for communication, signals, commands and transmission of data.	monitoring equipment of at least a fixed, portable or mobile monitoring equipment interconnected to a fixed, portable or mobile product, capable of wired or wireless communication therebetween; and	Seven wireless interfaces now found in the Samsung Galaxy S8 high-end smartphone - Frequency Division Duplex Cellular, Time Division Duplex Cellular, Wi-Fi, Bluetooth, GNSS (Global Navigation Satellite System), Near-Field Communication, and Wireless Charging

34. The automatic/mechanical lock disabler system [of claim 33] wherein the automatic/mechanical lock disabler is designed to be used with or without biometrics for authentication and identification, thereby allowing access to the product by authorized, trained and equipped individuals and preventing access to the product by unauthorized, untrained, and equipped individuals. (8,106,752)	124. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have products to be monitored, the devices that are monitoring, communication devices, communication equipment can be grouped into anti-terrorist product groupings based on the categories of similarities of design of at least one of: sensors, software, interfaces, detector cases, locks, mobile communication devices, handheld communication devices...; similarities in material composition..., similarities in security problems of at least one of: theft, detection for chemical, biological, radiological, nuclear, explosive compounds and agents, detection for weapons of mass destruction, biometrics for identifying terrorist...; grouping security devices to form a network of ubiquitous sensing and detecting,
whereupon the monitoring equipment, is interconnected to a product equipped to receive signals from or send signals to the lock disabling mechanism that is able to engage, disengage, or disable the lock, activate or deactivate security systems, activate or deactivate multi-sensor detection systems, or to activate or deactivate cell phone detection systems;	wherein the monitoring equipment is implemented by business or government at a minimum cost by products grouped together by common features in at least one of several product groupings of design similarity;
The Samsung Galaxy S8 Edge is smart lock enabled, meaning you won't need to offer up a fingerprint, pin or password to unlock the handset if a trusted Bluetooth device is near. The S8 instantly registers a fingerprint and unlocks. Samsung Galaxy's "Find My Mobile" remotely locate the phone via its onboard GPS chip, remotely lock the device with a passcode and remotely cause the device to emit a loud ring. The Samsung Galaxy S8 capable of automatically transmitting a signal to lock after several failed log in attempts.	The DHS S&T pursued what's known as cooperative research agreements (year 2008) with four cell phone manufacturers; Qualcomm, LG, Apple, and Samsung, for the development of mobile devices that has chem/bio detection capabilities (Cell-All Project). Seven wireless interfaces found in the Samsung Galaxy S8 smartphone - Frequency Division Duplex Cellular, Time Division Duplex Cellular, Wi-Fi, Bluetooth, GNSS (Global Navigation Satellite System), Near-Field Communication, and Wireless Charging. The Samsung Galaxy S8 include receivers for GPS. The S8 Edge is smart lock enabled, meaning no fingerprint, pin or password to unlock the handset if Bluetooth device is near. The S8 instantly registers a fingerprint and unlocks. The Samsung Galaxy S8 heart rate monitor also known as a Biosensor - Pulse/Oxy IC.

The Samsung Galaxy s8 can determine location using its built-in Global Positioning System (GPS) transmitter, Wi-Fi networks, and mobile networks. WLAN: Wi-Fi 802.11 a/b/g/n/ac, dual-band, Wi-Fi Direct, hotspot. Bluetooth: 5.0, A2DP, LE. GPS: A-GPS, GLONASS, BDS, GALILEO	wherein the at least one of the satellite connection, Bluetooth connection, WiFi connection, internet connection, radio frequency (RF) connection, cellular connection, broadband connection, long range radio frequency (RF) connection, or short range radio frequency (RF) connection is in signal communication with the transmitter, the receiver of the monitoring equipment, or transceivers of the products.	25. The communication device [of claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

RESPONDENT'S MOBILE DEVICE
GALAXY S8

WIRELESS/CELLULAR MODEM — 29
OPERATING SYSTEM (OS) — 27
RESPONDENT'S CENTRAL PROCESSING UNIT (CPU) — 26
GLOBAL POSITIONING SYSTEM (GPS) — 30
INTERNET WiFi — 28
GATEWAY - INTERFACE — 25

DISABLING LOCK MECHANISM AFTER MULTIPLE FAILED ATTEMPTS — 33
BIOMETRIC FINGERPRINT FACIAL IRIS — 32
RADIO FREQUENCY (RF) NEAR FIELD COMMUNICATION (NFC) — 31

SATELLITE — 14
INTERFACE — 24

CBRNE - H
DETECTION DEVICE:
PLACED IN, ON, UPON OR ADJACENT THE COMMUNICATION MONITORING, DETECTING CONTROLLING (CMDC) DEVICE

LOCATION CAPABILITY — 15
LOCATION CAPABILITY — 13
CPU — 11
SENSORS — 16
B — 20
N — 21
H — 22
C — 17
R — 18
E — 19
POWER SOURCE — 23
INTERFACE — 10

CELLULAR — 12

GATEWAY - INTERFACE — 6

COMPLAINANT'S
COMMUNICATION, MONITORING
DETECTING, CONTROLLING (CMDC) DEVICE

OPERATING SYSTEM (OS) — 4
WIRELESS/CELLULAR MODEM — 2
COMPLAINANT'S CENTRAL PROCESSING UNIT (CPU) — 1
INTERNET WiFi — 5
GLOBAL POSITIONING SYSTEM (GPS) — 3

RADIO FREQUENCY (RF) NEAR FIELD COMMUNICATION (NFC) — 9
BIOMETRIC FINGERPRINT FACIAL IRIS — 8
DISABLING LOCK MECHANISM AFTER MULTIPLE FAILED ATTEMPTS — 7

1. Complainant's Central Processing Unit (CPU): [Patent RE43,990]; Claim 16. The communication device of claim 11 wherein the communication device can be adapted or incorporated with cell phone towers and satellites for use with satellite communication and/or a cell tower, wi-fi, wi-max, broadband, GPS, navigation, radio frequency (RF) chips, radio frequency (RF) sensors, radio frequency (RF) transceivers, and radio frequencies for short and long range transmissions interconnected to the central processing unit (cpu).

2. Wireless/Cellular Modem: [Patent RE43,990]; Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

3. Global Positioning System (GPS): [Patent RE43,990]; Claim12. The communication device of claim 11 wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).

4. Operating System (OS): [Patent RE43,990] Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

5. Internet WiFi: [Patent RE43,990]; Claim 12. The communication device of claim 11 wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).

6. Gateway – Interface: [Patent RE43,990]; Claim 32. The communication device of claim 11 wherein the communication device having products to be monitored, the devices that are monitoring, communication devices, communication equipment can be grouped into anti-terrorist product groupings based on the categories of similarities of design of at least one of; sensors, software, interfaces, detector cases, locks, mobile communication devices, handheld communication devices, vehicle slowing and stopping devices.

7. Disabling Lock Mechanism after Multiple Failed Attempts: [Patent RE43,990]; Claim 22. The communication device of claim 11 wherein the communication device is designed to be equipped with applications for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, using a smart phone, cell phone, PDA, laptop or desktop.

8. Biometric Fingerprint Facial Iris: [Patent RE43,990]; Claim 30. The communication device of claim 11 wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition...

9. Radio Frequency (RF) Near Field Communication (NFC): [Patent RE43,990]; Claim 23. The communication device of claim 11 wherein the communication device is designed to be equipped with a radio frequency (RF) chip for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, capable of a two-way, bi-directional radio frequency (RF) communication link that makes the communication device work as a radio frequency (RF) sensor or a radio frequency (RF) transceiver.

10. Interface: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

11. CPU: [Patent RE43,990]; Claim 108. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case can be adapted or incorporated with cell phone towers and satellites for use with at least one of satellite communication, a cell tower, wi-fi, wi-max, broadband, GPS, navigation, radio frequency (RF) chips, radio frequency (RF) sensors, radio frequency (RF) transceivers, and radio frequencies for short and long range transmissions interconnected to a central processing unit (cpu).

12. Cellular: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

13. Location Capability: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

14. Satellite: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

15. Location Capability: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

16. Sensors: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

17. Chemical Sensor: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

18. Radiological Sensor: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

19. Explosive Sensor: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

20. Biological Sensor: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

21. Nuclear Sensor: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

22. Human Sensor: [Patent RE43,990]; Claim 125. A multi-sensor detection system for monitoring products and capable of operating with at least one of a designated perimeter sensor, a range sensor, a human sensor, a light sensor, a video sensor, a tampering sensor, a breach sensor, a temperature sensor, or a door sensor for an unauthorized or unscheduled door opening, comprising: at least one communication device of a cell phone, a cell phone detector case, a smart phone, a handheld, a PDA, a laptop, or a computer terminal at a monitoring site, and wherein the communication device has a central processing unit (cpu); at least one sensor that is a designated perimeter sensor, range sensor, human sensor

23. Power Source: [Patent RE43,990]; Claim 80. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded detector case, sensor array, central processing unit (CPU), power source of fuel, electric, solar or battery, automatic/mechanical internal or external lock disabler, biometric reader, camera, light, video, or interface.

24. Interface: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

25. Gateway – Interface: With the CBRNE-H Detection Device, the smartphone is the gateway. Using smartphones as our gateway to the Internet of Things we can add more context into activities. A complete Internet of Things (IoT) system integrates four distinct components: sensors/devices, connectivity, data processing, and a user interface. The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet.

26. Respondent's Central Processing Unit (CPU): This is the "brain" of the smartphone. The central processing unit (CPU) receives commands, makes instant calculations, and sends signals throughout the device. How the parts of the processor work together: The CPU connectivity features (GPS, WiFi), and 3G/4G modem are the major components of a mobile processor that control the operation of some of the most powerful and power-efficient smartphones.

27. Operating System (OS): Mobile operating systems combine features of a personal computer operating system with other features useful for mobile or handheld use; usually including, and most of the following considered essential in modern mobile systems; a cellular, Bluetooth, Wi-Fi, Global Positioning System (GPS) mobile navigation, speech recognition, near field communication (NFC).

28. Internet / WiFi: Connected devices also generate massive amounts of Internet traffic, including loads of data that can be used to make the devices useful. The Internet of Things (IoT), also sometimes referred to as the Internet of Everything (IoE), consists of all the web-enabled devices that collect, send and act on data they acquire from their surrounding environments using embedded sensors, processors and communication hardware. These devices, often called "connected" or "smart" devices, can sometimes talk to other related devices, a process called machine-to-machine (M2M) communication. The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet.

29. Wireless/Cellular Modem: These components control your connection to the world. Broadly speaking, the RF Transceiver receives and transmits voice connections and the modem enables your phone to send and receive digital signals. When enabled with 4G LTE, the radio and modem have a high-speed cellular wireless network at their disposal, capable of speeds that mimic your home Wi-Fi connection. When working closely with the CPU and GPU, a 4G LTE modem can deliver seamless, fluid access from your LTE network to your applications.

30. Global Positioning System (GPS): Your smartphone's GPS receiver analyzes high-frequency radio waves sent out from each satellite, with synchronized clocks in both the receiver and satellite recording the time that signals are transmitted, with the GPS chip timing exactly how long it takes to get from the satellite to your mobile phone – and it knows the speed of the signal, so with both those pieces of information, it can

work out the distance from the satellite. As long as your mobile device is receiving signal from three or more satellites, it's possible to work out where you are, by calculating how far you are from each satellite.

31. Radio Frequency (RF) Near Field Communication (NFC): NFC is a method of wireless data transfer that detects and then enables technology in close proximity to communicate without the need for an internet connection. The tech involved is deceptively simple: an NFC chip operates as one part of a wireless link. Once it's activated by another chip, small amounts of data between the two devices can be transferred when held a few centimeters from each other.

32. Biometric Fingerprint, Facial, and Iris: Previously seen mostly in military devices and fixed installations, iris scanning is joining other biometric authentication methods (such as fingerprint scanning, facial recognition and voice recognition) intended to move mobile devices beyond the limitations of password-based security.

33. Disabling Lock Mechanism after Multiple Failed Attempts: If you or someone else enters the wrong passcode too many times, your device will disable itself temporarily. The device can be remotely wiped after the specified number of failed password attempts.

SAMSUNG GALAXY S8 SPECS

DOMESTIC ECONOMY:
VERSION G950U: USA – (QUALCOMM)

Versions: G950F (Europe, Global Single-SIM); G950FD (Global Dual-SIM); **G950U (USA Unlocked); G950A (AT&T); G950P (Sprint); G950T (T-Mobile); G950V (Verizon); G950R4 (US Cellular)**; G950W (Canada); G950S/G950K/G950L (South Korea); G9500 (China)

NETWORK	Technology	GSM / HSPA / LTE
LAUNCH	Announced	2017, March
	Status	Available. Released 2017, April
BODY	Dimensions	148.9 x 68.1 x 8 mm (5.86 x 2.68 x 0.31 in)
	Weight	155 g (5.47 oz)
	Build	Front/back glass (Gorilla Glass 5) & aluminum frame
	SIM	Single SIM (Nano-SIM) or Hybrid Dual SIM (Nano-SIM, dual stand-by)
		- Samsung Pay (Visa, MasterCard certified)
		- IP68 certified – dust/water proof over 1.5 meter and 30 minutes
DISPLAY	Type	Super AMOLED capacitive touchscreen, 16M colors
	Size	5.8 inches, 84.8 cm^2 (~83.6% screen-to-body ratio)
	Resolution	1440 x 2960 pixels, 18.5:9 ratio (~570 ppi density)
	Multitouch	Yes
	Protection	Corning Gorilla Glass 5
		- 3D Touch (home button only)
		- Always-on display
PLATFORM	OS	**Android 7.0 (Nougat)**

	Chipset	Exynos 8895 Octa - EMEA **Qualcomm MSM8998 Snapdragon 835 - USA & China**
	CPU	Octa-core (4x2.3 GHz & 4x1.7 GHz) - EMEA **Octa-core (4x2.35 GHz Kryo & 4x1.9 GHz Kryo) - USA & China**
	GPU	Mali-G71 MP20 - EMEA Adreno 540 - USA & China
MEMORY	Card slot	microSD, up to 256 GB (uses SIM 2 slot) - dual SIM model only
	Internal	64 GB, 4 GB RAM
CAMERA	Primary	12 MP, f/1.7, 26mm, phase detection autofocus, OIS, LED flash, <u>check quality</u>
	Features	1/2.5" sensor size, 1.4 µm pixel size, geo-tagging, simultaneous 4K video and 9MP image recording, touch focus, **face/smile detection**, Auto HDR, panorama
	Video	2160p@30fps, 1080p@60fps, HDR, dual-video rec., <u>check quality</u>
	Secondary	8 MP, f/1.7, autofocus, 1440p@30fps, dual video call, Auto HDR
SOUND	Alert types	Vibration; MP3, WAV ringtones
	Loudspeaker	Yes
	3.5mm jack	Yes
		- 32-bit/384kHz audio - Active noise cancellation with dedicated mic
COMMS	WLAN	**Wi-Fi 802.11 a/b/g/n/ac, dual-band, Wi-Fi Direct, hotspot**
	Bluetooth	**5.0, A2DP, LE, aptX**
	GPS	**Yes, with A-GPS, GLONASS, BDS, GALILEO**
	NFC	**Yes**
	Radio	No

	USB	3.1, Type-C 1.0 reversible connector
FEATURES	**Sensors**	**Iris scanner, fingerprint (rear-mounted)**, accelerometer, gyro, proximity, compass, barometer, **heart rate**, SpO2
	Messaging	SMS(threaded view), MMS, Email, Push Mail, IM
	Browser	HTML5
	Java	No
		- Samsung DeX (desktop experience support)
		- Fast battery charging (Quick Charge 2.0)
		- Qi/PMA wireless charging (market dependent)
		- ANT+ support
		- **Bixby natural language commands and dictation**
		- MP4/DivX/XviD/H.265 player
		- Photo/video editor
		- Document editor
BATTERY		Non-removable Li-Ion 3000 mAh battery
	Talk time	Up to 20 h (3G)
	Music play	Up to 67 h
MISC	**Colors**	Midnight Black, Orchid Gray, Arctic Silver, Coral Blue, Maple Gold
	SAR	0.44 W/kg (head) 0.75 W/kg (body)
	SAR EU	0.32 W/kg (head) 1.27 W/kg (body)
	Price	About 610 EUR
TESTS	**Performance**	Basemark OS II: 3272 / Basemark OS II 2.0: 3376
		Basemark X: 42370
	Display	Contrast ratio: Infinite (nominal), 4.768 (sunlight)
	Camera	**Photo** / Video
	Loudspeaker	Voice 66dB / Noise 70dB / Ring 72dB
	Audio quality	Noise -92.5dB / Crosstalk -92.8dB
	Battery life	Endurance rating 84h

Technical Rational

COMPLAINANT'S DEVICE: CMDC

SAMSUNG GEAR S3 CLASSIC

RESPONDENT'S MOBILE DEVICE: SAMSUNG GALAXY S8

Samsung Gear S3 (electronic device industry and wearable medical device industry); Samsung Galaxy Note 8 (mobile device industry)	Patent #: 9,589,439; Independent Claim 20	Patents: 8,106,752; & RE 43,990; Dependent Claims
Able to pair Samsung Gear S3 Classic with a Samsung phone, most Android phones, and iPhones. Around the back of the watch is a chem/bio optical heart rate sensor that delivers continuous tracking and heart rate readings during exercise. There's built-in GPS to track activities like running and cycling, plus a host of sensors including a heart rate monitor, barometer and speedometer. Samsung's built-in GPS for sports tracking and sending out SOS alerts. The addition of Under Armour's app suite means iPhone users can now get more out of the Gear S3 as a fitness device. Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)	A multi-sensor detection system for detecting at least one explosive, nuclear, contraband, chemical, biological, human, radiological agents or compound, comprising:	118. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

Claim		
118. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.	a plurality of sensors for detecting at least one chemical, biological, radiological, explosive, nuclear, human, or contraband agent or compound, capable of being disposed within, on, upon or adjacent a multi-sensor detection device;	Around the back of the watch is a chem/bio optical heart rate sensor (also classified as a human sensor) that delivers continuous tracking and heart rate readings during exercise? There's a built-in GPS to track activities like running and cycling, plus a host of sensors including a heart rate monitor, barometer and speedometer.
18. The communication device [of claim 11] wherein the communication device having a basic monitoring terminal can be adapted and incorporated to include desktop computers, notebook, PC's, laptops, cell phones, smart phones, LCD monitors, and satellite monitoring.	monitoring equipment of at least one of products grouped together by common features in a product groupings category of design similarity comprising at least one of a computer terminal, personal computer (PC), laptop, desktop, notebook PC, handheld, cell phone, personal digital assistant (PDA), or smart phone for at least one of a receipt or transmission of signals therebetween;	Able to pair Samsung Gear S3 Classic with a Samsung phone, most Android phones, and iPhones. Around the back of the watch is a chem/bio optical heart rate sensor that delivers continuous tracking and heart rate readings during exercise. There's built-in GPS to track activities like running and cycling, plus a host of sensors including a heart rate monitor, barometer and speedometer.
34. The automatic/mechanical lock disabler system [of claim 33] wherein the automatic/mechanical lock disabler is designed to be used with or without biometrics for authentication and identification, thereby allowing access to the product by authorized, trained and equipped individuals and preventing access to the product by unauthorized, untrained, and equipped individuals. (8,106,752)	wherein the monitoring equipment is equipped with a lock disabling mechanism that is able to engage (lock), or disengage (unlock), or disable (to make unavailable) a product's lock, wherein the lock disabling mechanism disables the product's lock after a specific number of tries by an unauthorized user to disengage the lock by maintaining the product's lock in the current state of the product's lock regardless of input entered to change the state of the product's lock by the unauthorized user;	Paired with to receive leverage from a Samsung smartphone: After several unsuccessful log-in attempts using a passcode or fingerprint, a Samsung device automatically locks itself up as a security feature. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)

Claim	Accused Product
92. The multi-sensor detection system [of claim 81], further comprising a global positioning system (GPS) receiver adapted for communication with at least one satellite. at least one cell phone tower interconnected to the monitoring equipment for sending signals thereto and receiving signals therefrom; or at least one satellite capable of transmitting signals to the monitoring equipment;	Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)
25. The communication device [of claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection. at least one satellite or at least one cell phone tower capable of signal communication between the multi-sensor detection device and the monitoring equipment;	Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)

25. The communication device [of claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.	at least one internet connection capable of communication between the multi-sensor detection device and the monitoring equipment; and
	Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)
92. The multi-sensor detection system [of claim 81], further comprising a global positioning system (GPS) receiver adapted for communication with at least one satellite.	whereupon a signal sent to a receiver of the multi-sensor detection device from a satellite; or to a cell phone tower; or through at least one of a short range radio frequency or a long range radio frequency; causes a signal to be sent to the monitoring equipment that includes location data and/or sensor data;
	Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)

124. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have products to be monitored, the devices that are monitoring, communication devices, communication equipment can be grouped into anti-terrorist product groupings based on the categories of similarities of design of at least one of: sensors, software, interfaces, detector cases, locks, mobile communication devices, handheld communication devices...; similarities in material composition..., similarities in security problems of at least one of: theft, detection for chemical, biological, radiological, nuclear, explosive compounds and agents, detection for weapons of mass destruction, biometrics for identifying terrorist...; grouping security devices to form a network of ubiquitous sensing and detecting.	wherein the multi-sensor detection device is implemented by business or government by products grouped together by common features in at least one of several product groupings of design similarity;	Able to pair Samsung Gear S3 Classic with a Samsung phone, most Android phones, and iPhones. Around the back of the watch is a chem/bio optical heart rate sensor that delivers continuous tracking and heart rate readings during exercise. There's built-in GPS to track activities like running and cycling, plus a host of sensors including a heart rate monitor, barometer and speedometer. Samsung's built-in GPS for sports tracking and sending out SOS alerts. The addition of Under Armour's app suite means iPhone users can now get more out of the Gear S3 as a fitness device. Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)

118. The multi-sensor detection system [of claim 103] wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

wherein the multi-sensor detection device is for any of one or more products comprising a maritime cargo container, a lock, or the monitoring equipment;

The Gear S3 Classic need to connect to a mobile device (e.g. Galaxy S8) using the Samsung Gear application. The application must be installed on the mobile device (e.g. Galaxy S8). Able to pair Samsung Gear S3 Classic with a Samsung phone, most Android phones, and iPhones. The Gear S3 Classic sensors include: Accelerometer; Gyroscope; Heart Rate; and, Barometer. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides.Connectivity include: 802.11 b/g/n WiFi; Bluetooth 4.2 A2DPO, LE; and near-field communication (NFC). GPS include: a GPS receiver and two apps, Nike+ and S Health that include GPS tracking support; and Glonass (satellite). Platform: operating system (OS) Tizen-based wearable platform 2.3.2..; chipset Exynos 7270; Central processing unit (CPU) dual-core 1.0 Ghz

Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, it'll pull through the contacts and calls can be made from the wrist. There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)	wherein at least one of a satellite connection, Bluetooth connection, WiFi connection, internet connection, radio frequency (RF) connection, cellular connection, broadband connection, long range radio frequency connection, or short range radio frequency connection is in signal communication with a transmitter and a receiver of the monitoring equipment or multi-sensor detection device and transceivers of the products.	25. The communication device [of claim 11] wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

1. Complainant's Central Processing Unit (CPU): [Patent RE43,990]; Claim 16. The communication device of claim 11 wherein the communication device can be adapted or incorporated with cell phone towers and satellites for use with satellite communication and/or a cell tower, wi-fi, wi-max, broadband, GPS, navigation, radio frequency (RF) chips, radio frequency (RF) sensors, radio frequency (RF) transceivers, and radio frequencies for short and long range transmissions interconnected to the central processing unit (cpu).

2. Wireless/Cellular Modem: [Patent RE43,990]; Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

3. Global Positioning System (GPS): [Patent RE43,990]; Claim12. The communication device of claim 11 wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).

4. Operating System (OS): [Patent RE43,990] Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

5. Internet WiFi: [Patent RE43,990]; Claim 12. The communication device of claim 11 wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).

6. Gateway – Interface: [Patent RE43,990]; Claim 32. The communication device of claim 11 wherein the communication device having products to be monitored, the devices that are monitoring, communication devices, communication equipment can be grouped into anti-terrorist product groupings based on the categories of similarities of design of at least one of; sensors, software, interfaces, detector cases, locks, mobile communication devices, handheld communication devices, vehicle slowing and stopping devices.

7. Disabling Lock Mechanism after Multiple Failed Attempts: [Patent RE43,990]; Claim 22. The communication device of claim 11 wherein the communication device is designed to be equipped with applications for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, using a smart phone, cell phone, PDA, laptop or desktop.

8. Biometric Fingerprint Facial Iris: [Patent RE43,990]; Claim 30. The communication device of claim 11 wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition....

9. Radio Frequency (RF) Near Field Communication (NFC): [Patent RE43,990]; Claim 23. The communication device of claim 11 wherein the communication device is designed to be equipped with a radio frequency (RF) chip for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, capable of a two-way, bi-directional radio frequency (RF) communication link that makes the communication device work as a radio frequency (RF) sensor or a radio frequency (RF) transceiver.

10. Interface: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

11. CPU: [Patent RE43,990]; Claim 108. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case can be adapted or incorporated with cell phone towers and satellites for use with at least one of satellite communication, a cell tower, wi-fi, wi-max, broadband, GPS, navigation, radio frequency (RF) chips, radio frequency (RF) sensors, radio frequency (RF) transceivers, and radio frequencies for short and long range transmissions interconnected to a central processing unit (cpu).

12. Cellular: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

13. Cellular: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

14. Satellite: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

15. GPS: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component

16. Operating System: [Patent RE43,990] Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

17. Wi-Fi: [Patent RE43,990]; Claim 25. The communication device of claim 11 wherein the communication device has at least one of a Bluetooth connection, a Wi-Fi connection, a short and long range radio frequency connection, a Cellular connection, a satellite connection, and a GPS connection.

18. NFC: [Patent RE43,990]; Claim 23. The communication device of claim 11 wherein the communication device is designed to be equipped with a radio frequency (RF) chip for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, capable of a two-way, bi-directional radio frequency (RF) communication link that makes the communication device work as a radio frequency (RF) sensor or a radio frequency (RF) transceiver.

19. Chem/Bio Heart Rate Sensors: [Patent RE43,990]; Claim 118. The multi-sensor detection system of claim 103 wherein the cell phone, the smart phone, and the cell phone detector case have a plurality of sensors for detecting at least one of a chemical, biological, radiological, nuclear, explosive and contraband agents and compounds which are capable of being disposed within the cell phone, the smart phone, or the cell phone detector case.

20. Interface: [Patent RE43,990]; Claim 78. The built-in, embedded multi sensor detection system of claim 74 wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.

21. Gateway – Interface: With the smartwatch, the smartphone is the gateway. Using smartphones as our gateway to the Internet of Things we can add more context into activities. A complete Internet of Things (IoT) system integrates four distinct components: sensors/devices, connectivity, data processing, and a user interface. The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet. With an open gateway architecture, any smartwatch could ask any smartphone it encounters to agree to act as a gateway. The phone could then provide a connection for any low-bandwidth Internet applications running on the device.

22. Respondent's Central Processing Unit (CPU): This is the "brain" of the smartphone. The central processing unit (CPU) receives commands, makes instant calculations, and sends signals throughout the device. How the parts of the processor work together: The CPU connectivity features (GPS, WiFi), and 3G/4G modem are the major components of a mobile processor that control the operation of some of the most powerful and power-efficient smartphones.

23. Operating System (OS): Mobile operating systems combine features of a personal computer operating system with other features useful for mobile or handheld use; usually including, and most of the following considered essential in modern mobile systems; a cellular, Bluetooth, Wi-Fi, Global Positioning System (GPS) mobile navigation, speech recognition, near field communication (NFC).

24. Internet / WiFi: Connected devices also generate massive amounts of Internet traffic, including loads of data that can be used to make the devices useful. The Internet of Things (IoT), also sometimes referred to as the Internet of Everything (IoE), consists of all the web-enabled devices that collect, send and act on data they acquire from their surrounding environments using embedded sensors, processors and communication hardware. These devices, often called "connected" or "smart" devices, can sometimes talk to other related devices, a process called machine-to-machine (M2M) communication. The sensors/devices can be connected to the cloud through a variety of methods including: cellular, satellite, WiFi, Bluetooth, low-power wide-area networks (LPWAN), or connecting directly to the internet.

25. Wireless/Cellular Modem: These components control your connection to the world. Broadly speaking, the RF Transceiver receives and transmits voice connections and the modem enables your phone to send and receive digital signals. When enabled with 4G LTE, the radio and modem have a high-speed cellular wireless network at their disposal, capable of speeds that mimic your home Wi-Fi connection. When working closely with the CPU and GPU, a 4G LTE modem can deliver seamless, fluid access from your LTE network to your applications.

26. Global Positioning System (GPS): Your smartphone's GPS receiver analyzes high-frequency radio waves sent out from each satellite, with synchronized clocks in both the receiver and satellite recording the time that signals are transmitted, with the GPS chip timing exactly how long it takes to get from the satellite to your mobile phone – and it knows the speed of the signal, so with both those pieces of information, it can work out the distance from the satellite. As long as your mobile device is receiving signal from three or more satellites, it's possible to work out where you are, by calculating how far you are from each satellite.

27. Radio Frequency (RF) Near Field Communication (NFC): NFC is a method of wireless data transfer that detects and then enables technology in close proximity to communicate without the need for an internet connection. The tech involved is deceptively simple: an NFC chip operates as one part of a wireless link. Once it's activated by another chip, small amounts of data between the two devices can be transferred when held a few centimeters from each other.

28. Biometric Fingerprint, Facial, Iris: Previously seen mostly in military devices and fixed installations, iris scanning is joining other biometric authentication methods (such as fingerprint scanning, facial recognition and voice recognition) intended to move mobile devices beyond the limitations of password-based security.

29. Disabling Lock Mechanism after Multiple Failed Attempts: If you or someone else enters the wrong passcode too many times, your device will disable itself temporarily. The device can be remotely wiped after the specified number of failed password attempts.

SAMSUNG GEAR S3 CLASSIC SPECS

DOMESTIC ECONOMY:
USA - Samsung Gear S3 Classis requires at least a Samsung Smartphone

NETWORK	Technology	No cellular connectivity
LAUNCH	Announced	2016, August
	Status	Available. Released 2016, November
BODY	Dimensions	49 x 46 x 12.9 mm (1.93 x 1.81 x 0.51 in)
	Weight	59 g (2.08 oz)
	Build	Stainless Steel 316L
	SIM	No
		- Samsung Pay
		- IP68 certified - dust/water proof over 1.5 meter and 30 minutes
		- Compatible with standard 22mm straps
DISPLAY	Type	Super AMOLED capacitive touchscreen, 16M colors
	Size	1.3 inches, 10.8 cm² (~48.1% screen-to-body ratio)
	Resolution	360 x 360 pixels, 1:1 ratio (~278 ppi density)
	Multitouch	Yes
	Protection	Corning Gorilla Glass SR+
		- Always-on display
		- Rotating bezel
PLATFORM	OS	**Tizen-based wearable platform 2.3.2**
	Chipset	**Exynos 7270**
	CPU	**Dual-core 1.0 GHz**
MEMORY	Card slot	No
	Internal	4 GB, 768 MB RAM
CAMERA		No

SOUND	Alert types	Vibration; MP3, WAV ringtones
	Loudspeaker	Yes
	3.5mm jack	No
COMMS	WLAN	**Wi-Fi 802.11 b/g/n**
	Bluetooth	**4.2, A2DP, LE**
	GPS	**Yes, GLONASS**
	NFC	**Yes**
	Radio	No
	USB	No
FEATURES	Sensors	Accelerometer, gyro, **heart rate**, barometer
	Messaging	SMS(threaded view), Email, IM
	Browser	No
	Java	No
		- WPC wireless charging
		- **S-Voice natural language commands and dictation**
		- MP3/M4A/AAC/WAV player
		- **Photo** viewer
		- Voice memo/dial/commands
BATTERY		Non-removable Li-Ion 380 mAh battery
	Stand-by	Up to 72 h (mixed usage) (2G) / Up to 72 h (3G)
MISC	Colors	Silver
	Price	About 390 EUR

DOMESTIC CLAIM CHART

Complainant RE43,990 Patent Dependent Claims	Samsung's Technological Capability and Industry	Samsung's Technological Capability (Description)
12. The communication device of [claim 11] wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).	Central Processing Unit (CPU) **Industry for Processors**	Octa-core processor made of eight processor cores power Galaxy smartphones. The processor enables Galaxy smartphones to carry out more advanced tasks making the devices capable and efficient. The Octa-core processor also gives Galaxy devices faster load times. The Exynos 8890 features company's first custom designed CPU based on 64-bit ARMv8 architecture to break through from conventional CPU technology.
16. The communication device of [claim 11] wherein the communication device can be adapted or incorporated with cell phone towers and satellites for use with satellite communication and/or a cell tower, wi-fi, wi-max, broadband, GPS, navigation, radio frequency (RF) chips, radio frequency (RF) sensors, radio frequency (RF) transceivers, and radio frequencies for short and long range transmissions interconnected to the central processing unit (cpu).	NFC **Wireless Networking Technology Industry**	Samsung's NFC has such a close transmit range, it is less vulnerable to data hijacking; two parties can communicate with each other; it can send and receive data is more secure. Bluetooth or Wi-Fi requires a pairing, NFC doesn't. NFCs high RF performance makes Samsung's new NFC special.
21. The communication device of [claim 11] wherein the communication device includes a power connection that is interconnected to the central processing unit (cpu) and power source can be battery, electrical, or solar.	Central Processing Unit (CPU) **Industry for Processors**	Octa-core processor made of eight processor cores power Galaxy smartphones. The processor enables Galaxy smartphones to carry out more advanced tasks making the devices capable and efficient. The Octa-core processor also gives Galaxy devices faster load times. The Exynos 8890 features company's first custom designed CPU based on 64-bit ARMv8 architecture to break through from conventional CPU technology.

Complainant RE43,990 Patent Dependent Claims	Samsung's Technological Capability and Industry	Samsung's Technological Capability (Description)
22. The communication device of [claim 11] wherein the communication device is designed to be equipped with applications for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, using a smart phone, cell phone, PDA, laptop or desktop.	Home and Community **Wireless Networking Technology Industry**	The Samsung SmartThings Hub communicates information from your smartphone to all of your different connected products–regardless of their wireless protocol–so that you can easily monitor and control them from the free SmartThings app. The SmartThings app turns the Samsung Galaxy Note 8 smartphone into a remote to control all of the smart devices in your home.
22. The communication device of [claim 11] wherein the communication device is designed to be equipped with applications for the locking, disabling a lock, enabling a lock, and unlocking the locks of, but not limited to, containers, vehicles, houses and businesses, using a smart phone, cell phone, PDA, laptop or desktop.	Disabling Lock **Locking Industry**	After several unsuccessful log-in attempts using a passcode or fingerprint, a Samsung device automatically locks itself up as a security feature. If user is unable to log in after doing all the security layers, there's no other option but to have the phone unlocked.
30. The communication device of [claim 11] wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition, voice recognition, face recognition, hand geometry, retina scan, iris scan, heart rate, pulse or signature, thereby allowing access to the product by authorized, trained, and equipped individuals and preventing access to the product by unauthorized, untrained, and unequipped individuals.	Biometrics **Biometrics Industry**	Samsung allows 4 fingerprints to set-up the fingerprint scanner; for log-in and lock-out.

Complainant RE43,990 Patent Dependent Claims	Samsung's Technological Capability and Industry	Samsung's Technological Capability (Description)
30. The communication device of [claim 11] wherein the communication device is designed to be used with or without biometrics for authentication and identification, with at least one of a fingerprint recognition, voice recognition, face recognition, hand geometry, retina scan, iris scan, heart rate, pulse or signature, thereby allowing access to the product by authorized, trained, and equipped individuals and preventing access to the product by unauthorized, untrained, and unequipped individuals.	Biometrics **Biometrics Industry**	Samsung's Face unlock uses the front-facing camera to identify the user and unlock the device. Samsung's iris scanning method, uses special sensors on front of phone to identify and unlock the device.
39. The lock disabler system of [claim 33] wherein the automatic/mechanical lock disabler detection device has a power connection which is interconnected to the central processing unit (cpu) and includes a power source of battery, electrical or solar.	Central Processing Unit (CPU) **Industry for Processors**	Octa-core processor made of eight processor cores power Galaxy smartphones. The processor enables Galaxy smartphones to carry out more advanced tasks making the devices capable and efficient. The Octa-core processor also gives Galaxy devices faster load times. The Exynos 8890 features company's first custom designed CPU based on 64-bit ARMv8 architecture to break through from conventional CPU technology.
41. The lock disabler system of [claim 33] wherein the automatic/mechanical lock disabler detection device includes at least one of; a Blue tooth connection, a Wi-Fi connection, a short and long range radio frequency connection, an Internet connection, a Cellular connection, a Satellite connection, all of which are capable of being interconnected to a central processing unit (cpu) of the communication device.	Central Processing Unit (CPU) **Industry for Processors**	Octa-core processor made of eight processor cores power Galaxy smartphones. The processor enables Galaxy smartphones to carry out more advanced tasks making the devices capable and efficient. The Octa-core processor also gives Galaxy devices faster load times. The Exynos 8890 features company's first custom designed CPU based on 64-bit ARMv8 architecture to break through from conventional CPU technology.

Complainant RE43,990 Patent Dependent Claims	Samsung's Technological Capability and Industry	Samsung's Technological Capability (Description)
55. The multi-sensor detection system of [claim 33] wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).	Central Processing Unit (CPU) **Industry for Processors**	The Octa-core processor is made up of eight processor cores that power Galaxy smartphones. The processor enables Galaxy smartphones to carry out more advanced tasks making the devices capable and efficient. The Octa-core processor also gives Galaxy devices faster load times. The Exynos 8890 features company's first custom designed CPU based on 64-bit ARMv8 architecture to break through from conventional CPU technology.
78. The built-in, embedded multi sensor detection system of [claim 74] wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.	Cellular and Wireless Modem: Smartwatches **Electronic Device Industry**	Once successfully paired the S3 with a Samsung or other Android phone over Bluetooth, the best wearable plan in wireless when you add your Gear S3 to your current smartphone plan . There's near-field communication (NFC) on board that gives an alternative way to pay for things from the watch. SmartThings users can turn on/turn off, unlock/lock their SmartThings devices from their Gear S3 smartwatch via the Tasker plugin that a SharpTools app provides. WLAN: Wi-Fi 802.11 b/g/n. Bluetooth: 4.2, A2DP, LE. GPS: GLONASS (satellite capable)

Complainant RE43,990 Patent Dependent Claims	Samsung's Technological Capability and Industry	Samsung's Technological Capability (Description)
78. The built-in, embedded multi sensor detection system of [claim 74] wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.	Cellular and Wireless Modem: Smartphone **Mobile Device Industry**	Cellular data connection: The connection that the Galaxy Note 8 uses to exchange data over the air using your mobile operator's cellular network. Cellular network connection: the Galaxy Note 8 uses for voice and data connect. This network is managed by the mobile operator. WLAN: Wi-Fi 802.11 a/b/g/n/ac, dual-band, Wi-Fi Direct, hotspot. Bluetooth: 5.0, A2DP, EDR, LE. GPS, A-GPS, Glonass (satellite), BDS, Galileo (satellite)
78. The built-in, embedded multi sensor detection system of [claim 74] wherein the product includes at least one of a built-in, embedded internet component, a global positioning (GPS) component, a navigation component, a tracking component, a cellular component, a satellite component, a short and long range radio frequency component, radio frequency (RF) sensor, radio frequency (RF) transceiver, Wi-Fi, antenna, Bluetooth, or interface/gateway component.	Wi-Fi **Wireless Networking Technology Industry**	The Exynos 8890 integrates LTE-advanced modem that supports latest LTE specifications up to Category 12/13 for faster and seamless mobile communication. LTE is a single SIM (GSM). Connectivity options include Wi-Fi, GPS, Bluetooth, FM, 3G and 4G. Sensors on the phone include Proximity sensor, Accelerometer and Ambient light sensor.

Complainant RE43,990 Patent Dependent Claims	Samsung's Technological Capability and Industry	Samsung's Technological Capability (Description)
79. The built-in, embedded multi sensor detection system of [claim 74] wherein the product includes at least one of a built-in, embedded wireless and/or wired communication connection capable of sending signals and messages to a product; receiving signals and messages from a product; interconnected to at least one of a cell phone, a smart phone, a PDA, a handheld, a laptop, a desktop... or another product comprises a built-in, embedded wireless and/or wired...	Modems **Wireless Networking Technology Industry**	Samsung Modem/RF is a highly power efficient modem solution approved worldwide. The latest modem supports numerous global standards that offer seamless connection for a faster download and upload speed. Exynos 8890 is a LTE-Advanced Category 12/13 modem integrated one-chip solution that supports downlink speed of up to 600Mbps and uplink speed of up to 150Mbps.
79. The built-in, embedded multi sensor detection system of [claim 74] wherein the product includes at least one of a built-in, embedded wireless and/or wired communication connection capable of sending signals and messages to a product; receiving signals and messages from a product; interconnected to at least one of a cell phone, a smart phone, a PDA, a handheld, a laptop, a desktop... or another product comprises a built-in, embedded wireless and/or wired...	LTE **Wireless Networking Technology Industry**	The Exynos 8890 integrates LTE-advanced modem that supports latest LTE specifications up to Category 12/13 for faster and seamless mobile communication. LTE is a single SIM (GSM). Connectivity options include Wi-Fi, GPS, Bluetooth, FM, 3G and 4G. Sensors on the phone include Proximity sensor, Accelerometer and Ambient light sensor.
104. The multi-sensor detection system of [claim 103] wherein each cell phone detector case includes an internet connection, a GPS connection, a radio frequency (RF) connection, a recharging cradle or seat, a front side, a top, a bottom, a pair of opposed sides and a central processing unit (cpu).	Central Processing Unit (CPU) **Industry for Processors**	Octa-core processor made of eight processor cores power Galaxy smartphones. The processor enables Galaxy smartphones to carry out more advanced tasks making the devices capable and efficient. The Octa-core processor also gives Galaxy devices faster load times. The Exynos 8890 features company's first custom designed CPU based on 64-bit ARMv8 architecture to break through from conventional CPU technology.

Complainant RE43,990 Patent Dependent Claims	Samsung's Technological Capability and Industry	Samsung's Technological Capability (Description)
108. The multi-sensor detection system of [claim 103] wherein the cell phone, the smart phone, and the cell phone detector case can be adapted or incorporated with cell phone towers and satellites for use with at least one of satellite communication, a cell tower, wi-fi, wi-max, broadband, GPS, navigation, radio frequency (RF) chips, radio frequency (RF) sensors… and radio frequencies for short and long range transmissions interconnected to a central processing unit (cpu).	Central Processing Unit (CPU) **Industry for Processors**	Octa-core processor made of eight processor cores power Galaxy smartphones. The processor enables Galaxy smartphones to carry out more advanced tasks making the devices capable and efficient. The Octa-core processor also gives Galaxy devices faster load times. The Exynos 8890 features company's first custom designed CPU based on 64-bit ARMv8 architecture to break through from conventional CPU technology.
113. The multi-sensor detection system of [claim 103] wherein the cell phone, the smart phone, and the cell phone detector case includes a power connection that is interconnected to a central processing unit (cpu), and wherein a power source can be battery, electrical, or solar.	Central Processing Unit (CPU) **Industry for Processors**	Octa-core processor made of eight processor cores power Galaxy smartphones. The processor enables Galaxy smartphones to carry out more advanced tasks making the devices capable and efficient. The Octa-core processor also gives Galaxy devices faster load times. The Exynos 8890 features company's first custom designed CPU based on 64-bit ARMv8 architecture to break through from conventional CPU technology.
126. The multi-sensor detection system of [claim 125] wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).	Samsung Processor: Smartwatches **Industry for Processors** **Electronic Device Industry**	Samsung Gear S3 Watch (Dual-Core 1.1 GHz Processor) Samsung Gear S2 3G Watch (Qualcomm Snapdragon 400 Processor); Samsung Gear S Watch (Qualcomm Snapdragon 400 Processor); LG Watch Sport (Qualcomm Snapdragon Wear 2100 Processor); LG Watch Style (Qualcomm Snapdragon Wear 2100 Processor); LG G Watch R (Qualcomm Snapdragon 400 Processor).

Complainant RE43,990 Patent Dependent Claims	Samsung's Technological Capability and Industry	Samsung's Technological Capability (Description)
126. The multi-sensor detection system of [claim 125] wherein each communication device includes at least one of an internet connection, a GPS connection, a radio frequency (RF) connection, or a central processing unit (cpu).	Samsung Processor: Smartphone **Industry for Processors** **Mobile Device Industry**	Samsung Galaxy S8 (Qualcomm Snapdragon 835 Processor); Samsung Galaxy Note 8 (Qualcomm Snapdragon 835 Processor); Samsung Galaxy S7 (Qualcomm Snapdragon 820 Processor); Samsung Galaxy S5 (Qualcomm Snapdragon 801 Processor); Samsung Galaxy S4 (Qualcomm Snapdragon 600 Processor); LG V30 (Qualcomm Snapdragon 835 Processor); LG G5 (Qualcomm Snapdragon 820 Processor); LG G4 (Qualcomm Snapdragon 808 Processor).
132. The multi-sensor detection system of [claim 125] wherein the internal or external remote/electrical lock disabler includes at least one of: a Blue tooth connection, a Wi-Fi connection, a short and long range radio frequency connection, an Internet connection, a Cellular connection, a Satellite connection, all of which are interconnected to the central processing unit (cpu).	Central Processing Unit (CPU) **Industry for Processors**	The Octa-core processor is made up of eight processor cores that power Galaxy smartphones. The processor enables Galaxy smartphones to carry out more advanced tasks making the devices capable and efficient. The Octa-core processor also gives Galaxy devices faster load times. The Exynos 8890 features company's first custom designed CPU based on 64-bit ARMv8 architecture to break through from conventional CPU technology.
134. The multi-sensor detection system of [claim 125] wherein a communication device, that of a cell phone, smart phone or handheld; capable of sending signals to a vehicle's operating equipment systems of at least one of, but not limited to, an ignition for starting and stopping, a lock for unlocking and locking, a horn for sounding; capable of receiving data and diagnostic information of the vehicle's operating equipment systems.	Car **Automobile Industry**	Samsung created Volkswagen app gives control over key features to car directly from smartwatch – Samsung Gear S3 Classic. The Gear S3, need to be connected to mobile device (e.g. Galaxy Note 8). Samsung's partnership with Volkswagen, for smartphone connections via Car Mode for Galaxy, an app powered by MirrorLink. Volkswagen Car-Net e-Remote, if own a VW and Gear S3, enables check that car is locked with smartwatch.

HISTORY

A U. S. DEPARTMENT OF HOMELAND SECURITY (BAA07-10)

"*CELL-ALL: Ubiquitous Biological and Chemical Sensing*"

CELL PHONE BIOLOGICAL AND CHEMICAL SENSING

Complainant's Proposal Submission dated 11/28/2007

Contracts to Qualcomm, LG, Apple, and Samsung

Cell-All: Super Smartphones Sniff Out Suspicious Substances | Homeland Security

Official website of the Department of Homeland Security

U.S. Department of
Homeland Security

Science and Technology

Science and Technology

- Our Work
- Strategic Directions
  - Business Opportunities
  - S&T News
  - About S&T
  - First Responders

Cell-All: Super Smartphones Sniff Out Suspicious Substances

Years ago, if you wanted to take a picture, you needed a dedicated camera. You needed to buy batteries for it, keep it charged, learn its controls, and lug it around. Today, chances are your cell phone is called a "smartphone" and came with a three-to-five megapixel lens built-in—not to mention an MP3 player, GPS, or even a bar code scanner.

This Swiss Army knife trend represents the natural progression of technology—as chips become smaller and more advanced, cell phones continue to absorb new functions. Yet, in the future, these new functions may not only make our lives easier, they could also protect us—and maybe even save our lives.

The Cell-All initiative may be one such savior. Spearheaded by the Department of Homeland Security's (DHS) Science and Technology Directorate (S&T), Cell-All aims to equip your cell phone with a sensor capable of detecting deadly chemicals at minimal cost—to the manufacturer (a buck a sensor) and to your phone's battery life. "Our goal is to create a lightweight, cost-effective, power-efficient solution," says Stephen Dennis, Cell-All's program manager.

How would this wizardry work? Just as antivirus software bides its time in the background and springs to life when it spies suspicious activity, so Cell-All regularly sniffs the surrounding air for certain volatile chemical compounds.

When a threat is sensed, a virtual *ah-choo!* ensues in one of two ways. For personal safety issues such as a chlorine gas leak, a warning is sounded; the user can choose a vibration, noise, text message, or phone call. For catastrophes such as a sarin gas attack, details—including time, location, and the compound—are phoned home to an emergency operations center.

While the first warning is beamed to individuals—a grandmother taking a siesta or a teenager hiking through the woods—the second warning works best with crowds. And that's where the genius of Cell-All lies—in crowdsourcing human safety.

Currently, if a person suspects that something is amiss, he *might* dial 9-1-1, though behavioral science tells us that it's easier to do nothing. If he does do something, it may be at a risk to his own life. And as is often the case when someone phones in an emergency, the caller may be frantic and difficult to understand, diminishing the quality of information that's relayed to first responders. An even worse scenario: the person may not even be aware of the danger, like the South Carolina woman who last year drove into a colorless, odorless, and poisonous ammonia cloud.

In contrast, anywhere a chemical threat breaks out—a mall, a bus, subway, or office—Cell-All will alert the authorities automatically. Detection, identification, and notification all take place in less than 60 seconds. Because the data are delivered digitally, Cell-All reduces the chance of human error. And by activating alerts from many people at once, Cell-All cleverly avoids the longstanding problem of false positives. The end result: emergency responders can get to the scene sooner and cover a larger area—essentially anywhere people are—casting a wider net than stationary sensors can.

But what about your privacy? Does this always-on surveillance mean that the government can track your precise whereabouts whenever it wants? To the contrary, Cell-All will operate only on an opt-in basis and will transmit data anonymously. "Privacy is as important as technology," avers Dennis. "After all, for Cell-All to succeed, people must be comfortable enough to turn it on in the first place."

For years, the idea of a handheld weapons of mass destruction detector has engaged engineers. In 2007, S&T called upon the private sector to develop concepts of operations. Today, thanks to increasingly successful prototype demonstrations, the Directorate is actively funding the next step in R&D—a proof of principle—to see if the concept is workable.

To this end, three teams from Qualcomm, the National Aeronautics and Space Administration (NASA), and Rhevision Technology are perfecting their specific area of expertise. Qualcomm engineers specialize in miniaturization and know how to shepherd a product to market. Scientists from the Center for Nanotechnology at NASA's Ames Research Center have experience with chemical sensing on low-powered platforms, such as the International Space Station. And technologists from Rhevision have developed an artificial nose—a piece of porous silicon that changes colors in the presence of certain molecules, which can be read spectrographically.

Similarly, S&T is pursuing what's known as cooperative research and development agreements with four cell phone manufacturers: Qualcomm, LG, Apple, and Samsung. These written agreements, which bring together a private company and a government agency for a specific project, often accelerate the commercialization of technology developed for government purposes. As a result, Dennis hopes to have 40 prototypes in about a year, the first of which will sniff out carbon monoxide and fire.

To be sure, Cell-All's commercialization may take several years. Yet the goal seems imminently achievable: Just as Bill Gates once envisioned a computer on every desk in every home, so Stephen Dennis envisions a chemical sensor in every cell phone in every pocket, purse, or belt holster. If it's not already the case, our smartphones may soon be smarter than we are.

To request more information about this story, please e-mail st.snapshots@hq.dhs.gov (mailto:st.snapshots@hq.dhs.gov).

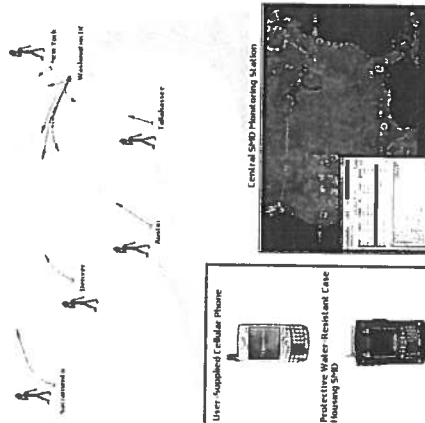"Proposal White Paper"

BROAD AGENCY ANNOUNCEMENT (BAA) 07-10

CELL-ALL Ubiquitous Biological and Chemical Sensing

<u>Administrative and Technical Points of Contact:</u>

Larry Golden, CEO
ATPG Technology, LLC
522 Peach Grove Place
Mauldin, SC 29662
864-288-5605 / 864-992-7104
lgolden5605@charter.net

Authorized Officer:

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BAA Number: CELL-ALL BAA07-10
Title: CELL-SMD; Multi Sensor-Detection

Offeror Name: ATPG TECHNOLOGY, LLC
Date: 11/28/2007

User Supplied Cellular Phone

Protective Water Resistant Case Housing SMD

Central SMD Monitoring Station

Operational Capability:

1. Ability to effectively sense/detect chemical agents, reliably and securely report position and detection readings.
   Provide software applications to easily manage large scale network.
   Design allows for straightforward integration with existing cell phones
   Ability to graphically depict and filter live data.

2. Goal: ability to detect chemical or biological agents 99%.
   Goal: network throughput 99%.

3. Prototype SMD(cell phone case) target cost is $50 in mass quantities (excluding sensor) Competition among sensor developers will drive final cost.

4. Durable, inexpensive device, does not degrade performance of host device
   Makes extensive use of existing technology and builds upon completed spiral of a similar device.

Proposed Technical Approach:

1. Provides Sensor Monitoring Device (SMD) in a protective cell phone case.
   Easy to distribute/integrate with cell phone Viewer/Management SW provides hierarchical levels for information flow

2. Incorporate selected sensors into existing SMD functional prototype
   Manufacture prototype cell phone cases to accommodate SMD and sensors
   Enhance/scale existing cell phone, web and desktop support applications

3. First spiral complete, yielded functional prototypes – SMD, web, desktop & cell phone applications

4. Established working relationships with Otter Box and ECBC

5. CELL-ALL technical approach & rational taken from, "Multi Sensor-Detection and Lock Disabling System", (Patent Pending; Pub., 10-18-07; App. #: 11/397,118;)

Schedule, Cost, Deliverables, & Contact:
One year Period of Performance, $1,000,000
Prototype and manufacture cell phone cases with integrated SMD, chemical and biological sensors
Enhance/scale viewer/management software to support large sensor network

Deliverables:
Prototyped cell phone case containing SMD and sensors
Cell phone & desktop viewer/management SW
System demonstration of: sensor detection, alert transmitted through hierarchy and control center messages to SMD

Corporate Information:
ATPG TECHNOLOGY, LLC
Larry Golden, CEO
522 Peach Grove Place
Mauldin, SC 29662
Phone: 864-288-5605
lgolden5605@charter.net

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Executive Summary:

Two years ago, recognizing the danger that existed if a WMD was concealed, transported and deployed within our borders, ATPG embarked on the development of a multi-sensor, tracking and detection system. The first development spiral yielded a functional Sensor Monitoring Device (SMD) prototype and tiered communication applications to distribute, monitor and manage the multi-sensor SMD network information. The ubiquitous sensor network solution proposed in this white paper borrows heavily from the technology developed in spiral one. The tiered communication, viewer and management software applications were designed to be part of a large sensor network. For this application the software will be scaled and enhanced to accommodate the volume of traffic that would result from an extremely large sensor network. Our SMD was designed to provide as much flexibility as possible and communicates with a variety of sensors through an array of built-in standard interfaces (SPI, A/D, Serial, Bluetooth, I2C etc). This existing open architecture design affords us the opportunity to collaborate with the U.S. Army Edgewood Chemical and Biological Center (ECBC) to evaluate, test and acquire the most appropriate miniaturized chemical and biological sensors.

ATPG intends to utilize the hardware and software technology developed in spiral one as the basis for the ubiquitous sensor network. The form factor of the SMD will be re-engineered so that it can initially be housed in cell phone cases allowing straightforward integration with existing cell phones. The SMD, housed in the cell phone cases will use a Bluetooth channel to communicate with ATPG software hosted on the cell phone. This software will provide bi-directional communication between the SMD and cell phone. The cell phone software will additionally use email and SMS messaging services to communicate information to control centers. The software for managing the information from the sensor network will be architected in a way that provides a means to efficiently escalate information up the government hierarchy. The software will employ a large database back-end and where practical message routing rules will be implemented to allow for effective and efficient routing of sensor message traffic.

Utility to Department of Homeland Security:

ATPG's strategy of incorporating its existing SMD design into cell phone cases provides a means to quickly establish a massive sensor network nationwide. ATPG proposes modifying the SMD form factor so that it can be installed into the most common cell phone cases. When a person volunteers for the program they would receive a cell phone case along with an adapter cord that would connect to their existing phone charger; allowing the SMD and phone to charge simultaneously. A switch on the case will allow the volunteer to enable the device at their discretion. If a volunteer elects to participate in the program and their cell phone does not have an on board GPS, the SMD provided in the cell phone case will be equipped with one. The geographic position of the SMD/cell phone pair will be determined either by GPS, cell phone tower database and signal strength or by a Wi-Fi hotspot database. In the event current position cannot be determined, the device will use its last known good position fix for communications and the position will be flagged as such. Housing the SMD and sensors in a cell phone case provides a number of advantages. Since the SMD will draw all of its power from its own power source the only resources required from the cell phone will be for a dedicated Bluetooth channel and limited processing power to execute the cell phone software. Additionally the consumables

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in the cell phone case (battery, sensors etc.) can easily be switched out, or the entire case can be easily replaced. ATPG will be working with the Otter Box Company to design a cell phone case capable of housing the SMD and its sensors, providing a protective, water resistant case while maintaining complete cell phone interactivity. This approach will allow ATPG to easily and incrementally make changes to the host platform as the technology of the SMD and its sensors are miniaturized.

Technical Approach:

The creation, implementation and management of a massive sensor network will require a design approach that delivers a system solution. Every tier of the system is important and the end product must be manageable, provide redundancy and implement an open architecture wherever possible. The ATPG solution proposed here focuses on these requirements and delivers a design that translates into a straightforward, deployable sensor network system that can be distributed en masse.

At the lowest level, the SMD is engineered to communicate with a variety of sensors through an array of standard interfaces (SPI, A/D, Serial, I2C etc). This open architecture allows for easily integrating additional sensors into the device and expanding the range of hazardous agents detectable by the SMD. The SMD will continually monitor/control the attached sensors and communicate with the cell phone via a dedicated Bluetooth channel. When the SMD is activated by the user, a small software application installed on the phone will monitor the Bluetooth channel for detection alerts and also forward commands received from control centers to the SMD. The SMD will periodically send its position information to the control center. The position the SMD will report to the control centers is determined using a layered approach. Initially the SMD will look to the on-board GPS (if provided) to determine position. If the cell phone is equipped with a GPS the application on the cell phone will retrieve the position from its own GPS. When a GPS position cannot be determined, the position of the SMD and its user will be calculated based on a cell phone tower database, provided by the FCC and signal strength. If this does not yield a result, the Wi-Fi hotspot database will be utilized to determine SMD and user position. If all these options fail, the last known position can be augmented with the on board accelerometers to estimate the current position which will be reported to the control centers and annotated as a last position and a possible position. All information received by the cell phone application from the SMD will be forwarded to the control centers either through email or SMS messages if email is not available. The information transmitted will be encoded in XML and encrypted prior to transmission. When a user needs to be notified of information from a control center, the cell phone software will use either a ring tone or vibration to call the user's attention to the display. This solution of integrating the SMD into the cell phone case and installing a small software application on the volunteer's cell phone provides a means to easily modify and upgrade the sensor network system as advancements are made to sensor and SMD technology with minimal impact to the user.

The web and desktop software that support the sensor network is designed to support an escalating reporting hierarchy. At each level rules can be established in the message routing software to facilitate the transfer of alert information. Rules can also be established to assist in determining the area affected by an alert. In the event a chemical or biological agent is detected

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and reported, the software can automatically search for other sensors in a pre-defined area and command them to sample and report back. This information can then be used by first responders and local government to determine the impacted area and aid in creating a plan of action to cope with the event. The reporting hierarchy can be configured as needed but the current configuration sends notification to the local First Responder units, followed by City, County, State and Federal government. As the information works its way up the hierarchy rules at each level fire off to create events that notify necessary personnel at each level. The viewer/management software used at each level of the hierarchy is identical. How the system forwards and responds to data is configured in the message routing rules table. The desktop software uses Google Earth as a viewer and plots the position of the sensors and detections on the map. Filtering options are provided in the software to allow the screen to be decluttered. A hierarchical database of sensors reporting to the viewers at a given control center is maintained to allow simple manipulation of the sensor network. The software will allow the user to drill down into lower levels of the data by clicking on the images on the map or through the windows explorer like interface provided. The software will also allow commands and alerts to be sent to SMD enabled cell phones by clicking on the image or on its text representation. Each SMD representation on the map will display its unique identification number as its label and clicking on the icon will display the last set of data received by the control center. The sensor network data can also be made available to smart phones and PDAs running a variation of the viewer/management software. All data passed through this network will be encrypted and all database and user accounts will be protected by multiple layers of security to ensure the privacy of the volunteers and protect their location from foreign/unwanted access.

As an option all messages sent from the SMD to the control centers could receive notification of receipt; confirmation that the network is operating properly. This could be a built-in fail safe, which would allow the user to be notified first if detection occurred and the information could not be transmitted to a control center. In this scenario the user would be notified of the detection and could take action to leave the area and contact authorities through some other means.

Personnel and Performer Qualifications and Experience:

Larry Golden is the CEO of ATPG and will be the project manager for this program. Mr. Golden's invention and patent pending sensor monitoring device (Pub. 10-18-07; App. #: 11/397,118) will be used as the departure point for the development of the SMD. Mr. Golden's background is in industrial engineering and management. Larry's duties will include managing the schedule, budget and subcontractors providing the cell phone cases.

Harold Kimball is a software engineer with twenty years experience developing software applications, including embedded systems, operational flight programs, database applications, and web and desktop applications. Mr. Kimball will be the technical lead on this program as well as the lead software developer for the SMD applications. Over the past few years Mr. Kimball's focus has been on developing situational awareness applications, embedded device applications and aircraft simulation software. Mr. Kimball has a Bachelor's degree in Computer Science and is working on his Master's Degree in Artificial Life. Mr. Kimball recently had an

article published describing a scalable disaster relief and communications infrastructure system he is developing to aid first responders and disaster relief personnel in their efforts.

Doug Cumbie is an electrical engineer and software engineer with six years experience developing embedded systems, web applications, situational awareness software and aircraft simulation software. Mr. Cumbie will be the lead Engineer on this program as well as the primary developer for the web and desktop applications. Over the past few years Mr. Cumbie has focused on embedded device development, situational awareness applications and aircraft simulation software. Mr. Cumbie holds Bachelor's degrees in both Computer Engineering and Electrical Engineering.

The Otter Box Corporation will provide custom cell phone cases for housing the SMD developed by ATPG. The Otter Box Corporation has extensive experience manufacturing and distributing custom cases for cell phones, laptops and PDAs. Their manufacturing and distribution experience will play a key role in the ability to efficiently develop, manufacture and distribute a custom cell phone case enveloping the SMD and providing a water resistant and protective case.

U.S. Army Edgewood Chemical and Biological Center (ECBC) will play a vital role in assisting ATPG with evaluating, testing and selecting the most appropriate miniaturized chemical and biological sensors available. ATPG and ECBC have a collaborative agreement in place ensuring ATPG of their services in sensor analysis and selection.

Commercialization and Capabilities:

ATPG will work closely with Otter Box and ECBC to determine the physical characteristics and requirements needed to create a custom cell phone enclosure for the selected sensors and SMD. ATPG will leverage Otter Box's manufacturing and distribution experience to enable ATPG to produce and deliver large quantities of custom cell phone cases. As mentioned previously the case will be designed and developed so that consumables can easily be swapped out or the entire cell phone case can be replaced. This approach ATPG is pursuing is the most economical and efficient way to mass distribute a sensor network; providing low risk and minimal impact to volunteers of the program. Becoming part of this volunteer network would be a simple process and would only require end-users to; elect to become a volunteer, indicate which type of cell phone they currently use and upon receipt of the new cell phone case commence holstering the cell phone in the case wherever they go. As an option and to solicit interest in the program, volunteers could be provided software applications. These applications could potentially access tracking information of the volunteer's phone and the volunteer's family members' phones; or a moving map application could be provided to enable navigation through the cell phone. Mr. Kimball and Mr. Cumbie have many years experience developing and distributing code to demanding end users. Both individuals have experience providing Situational Awareness and OFP software to the Air Force Special Operations Command (AFSOC) for all fixed wing Special Operations Forces (SOF) aircraft. Additionally, Mr. Kimball worked for Manheim Auctions, an international organization with a large customer base and participated in the development and distribution of Manheim's software applications.

One method ATPG conceived for fielding the sensor network and implementing its widespread use would be to conduct a pilot program for the nearly 30 million government employees, border patrol personnel and government contractors. These individuals generally work in what would be considered high value target areas. Providing these employees with cell phone cases equipped with the SMD and its sensors would immediately give the sensor network nationwide coverage in many areas that would be likely targets of a terrorist attack. In addition to gaining nationwide coverage; if this pilot program extended to all government employees and its contractors around the world, the network would have the ability to monitor U.S. interests globally.

Costs, Works and Schedule:

The budgeted cost for this development is $1,000,000, with a projected period of performance of one year. ATPG will simultaneously commence four primary tasks upon contract award.

1) ATPG will work with ECBC to evaluate, test and select the most appropriate chemical and biological miniaturized sensors available (4 month effort, $17,137)).

2) ATPG will research and determine the three most commonly used phones capable of being part of this sensor network and work with Otter Box to design and manufacture cell phone cases to house the SMD and sensors (4 month effort, $45,000).

3) ATPG will enhance/scale the software applications to support the potentially large volume sensor network that will comprise the Cell-All ubiquitous system (7 month effort, $500,000).

4) ATPG will restructure and scale down the SMD so it can be accommodated in the cell phone case. After month 7, integration and testing of the Cell-All system will commence. The system will be documented (block diagrams, wiring diagrams, and theory of operation manual) and a demonstration date will be scheduled (12 month effort, $437,863).

Prototype cases housing the SMD and sensors, cell phones and viewer/management software executables will be delivered upon project completion.

Small Business Considerations:

This white paper is submitted from a minority owned small business.

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HOMELAND SECURITY ADVANCED RESEARCH PROJECTS AGENCY

- Promote revolutionary changes in technology

- Accelerate technology prototyping

- Advance the development, testing, and evaluation

- Deployment of critical home security technologies

Homeland
Security
Science and Technology

CELL ALL

SUMMARY: Widely distributed system of small chemical agent detectors that provide rapid detection, classification, and notification to decision makers

CUSTOMERS: Public, Responders, Chemical Facilities Sector & DNDO

WHAT'S NEXT: Commercialization Activities in the Mobile and other industries.

Homeland Security
Science and Technology

Motivations to Improve Detection

- Large, expensive, stationary systems represent state of the art chemical agent detection

- Variety of less-expensive handheld systems available as separate systems for mobile response

- Geographic coverage of these systems limited to specific areas of deployment

- Sampling may not reflect actual environment where people are actually located

Homeland
Security

Science and Technology

Opportunity for Innovation

Large, dynamic sensing system

- Miniaturized, effective sensor capability
- Integrate new low-cost sensing into common devices
  - Move sensing applications to the edge
- Harvest benefits of network effects and crowd sourcing
- Opt-In for monitored systems for Privacy Protection
- Integrate with 300+ million cell phones now used in U.S.
- Leverage billions of dollars spent each year in sensor, carrier network and cell phone development
  - Wireless Industry, Industrial Sensing, Defense Investments

Result: Early indications and warning for hazardous chemical events

Homeland Security

Science and Technology

Technical Approach

Revolutionary Technology & Accelerated Prototyping

Embeddable Miniature Sensors

- Sample collection
- Reusable devices with lifetimes of at least 18 months
- Functional sensor sensitivity & selectivity in the environment
- Prototype concepts for integrated sensing Devices
- Methods and concepts for disseminating of sensor information

Accelerated Prototyping

& Advance Development, Test and Evaluation

Sensing Network to Significantly Expand Coverage

- Investigate Sensor Performance in a Larger Scale Networks
- Operational Evaluation for Responder Environments
- Concepts of Operation for Ubiquitous Sensing

Homeland
Security

Science and Technology

CellAll Team

HSARPA
Concepts, Architecture & Resources

NASA
Sensor Development and Systems Integration

Leveraging years of investment in nanotechnology & sensing platforms to support manned space flight

Synkera
Sensor and Sensing Module Development

Leveraging the Innovation Engine of Small Business to create a new class of miniature sensors through SBIR.

Qualcomm Inc.
Systems Design/Integration

Leveraging the worlds largest semiconductor supplier to the wireless industry.

NC4
Data consolidation and visualization for 24/7 Information Service

First Responder Advisors

Homeland Security

Science and Technology

Revolutionary Technology & Advanced Prototyping

- Established miniature sensor efficacy

- Discovered parameters for cell phone integration

- Developed first generation prototypes

- Proof of concept demonstrations

  - NASA – Leveraging nanosensor work for space missions to further miniaturizing space-qualified integrated sensing system for detection of chemical agents using smartphones.

  - Synkera – Leveraging SBIR funded development of miniature sensors.

  - Qualcomm – Using existing hardware platform to integrate existing sensor & demonstrate ability to sense chemical agents

Homeland
Security

Science and Technology

Phase I Prototypes
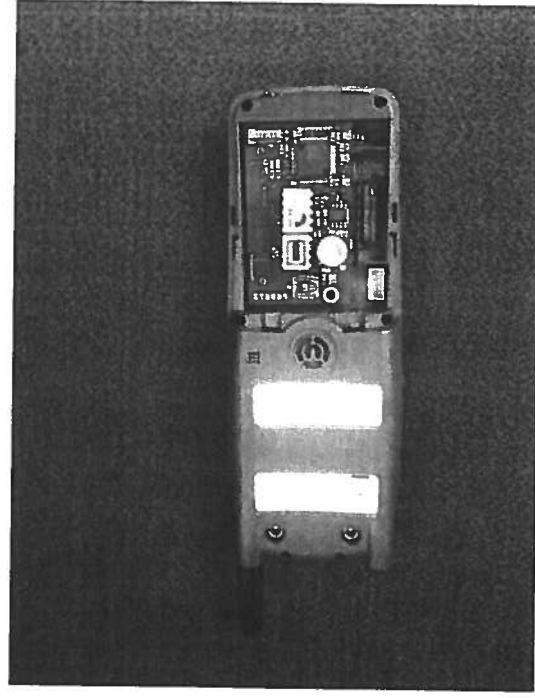
NASA ARC nanosensor module for iPhone integration

Qualcomm FFA
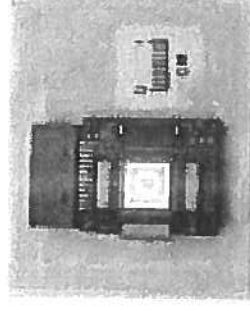
iPhone Specifications
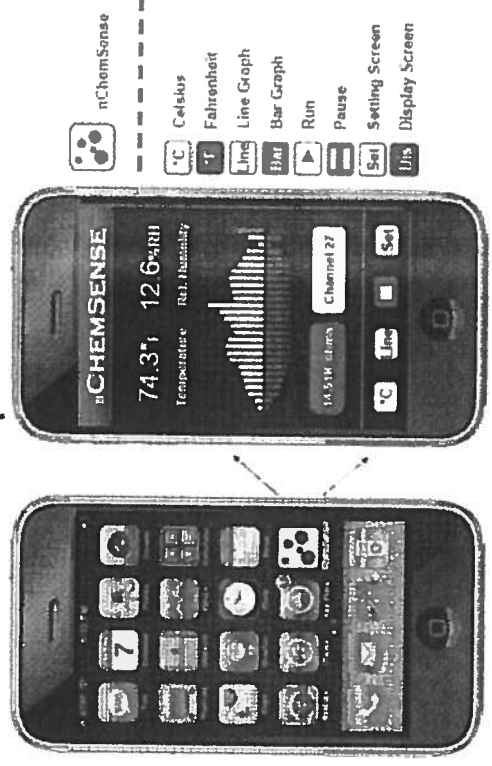
Homeland Security

Science and Technology

Phase II Prototype Goals

- Achieve greater number of total prototype devices at reasonable unit cost
- Sensor data transmission via 3g and/or Wi-Fi
- Multiple sensors network for chemical profiling
- Decouple chemical sensor from phone.
- Multiple sensor units per phone are possible
- Bluetooth/Proprietary Interfaces
- Standardize sensor platforms
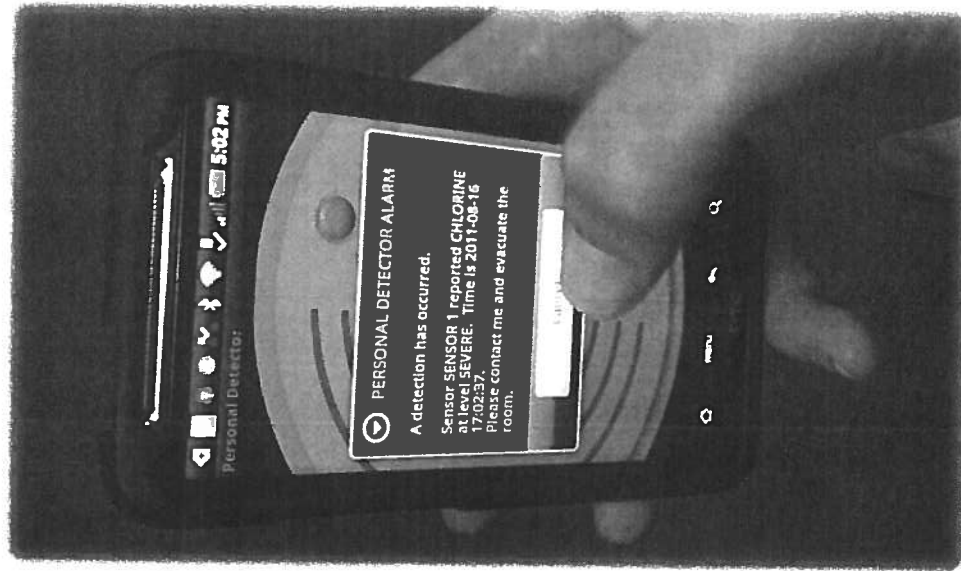- Increase opportunities for participation

Homeland
Security

Science and Technology

Phase II Prototypes
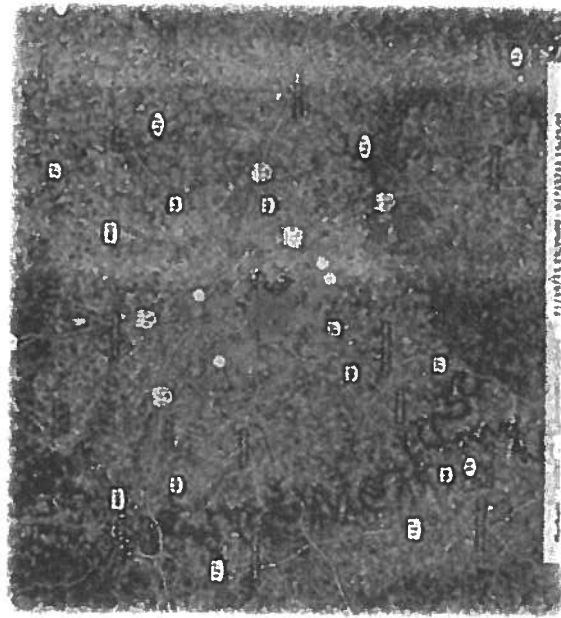
Homeland
Security

Science and Technology

Commercial Opportunities

- Focus Group Analysis for Cell Phone Based Sensing
  - Personal Protection Applications Sell
  - Privacy is Important
  - Reliance on Local Officials
- Multiple Market Business Models
- Spin-off Sensor Applications
  - Medical Diagnostics
  - Multi-gas Detectors for Firefighter Applications

Homeland Security

Science and Technology

Demonstrations

- Domestic Preparedness Application
  - Toxic Chemical Agents (Public & Industrial Safety)
  - Hazardous Materials Response Team Scenario
  - Network response
  - Geographic-based visualization

- LAFD, Frank Hotchkins Memorial Training Center
  - Carbon Monoxide (Personal Safety)
  - Personal Protection Scenario - Audio Alarm
  - In Case of Emergency (ICE) Alerts
  - Network Command/Control
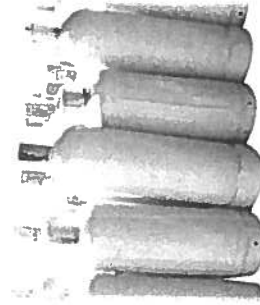
Homeland Security

Science and Technology

Enabling a Spectrum of Applications

Personal Safety

Industrial Safety
(Critical Infrastructure)

Public Safety

Homeland Security

Science and Technology

Status

Government Funding has Ended

Cost Shared Commercial Funding Continues

Venture Capital Active

Niche Products Available Now

First Large Scale Commercial Product Launch within 1 Year

Homeland Security

Science and Technology